# FINAL LICENSE APPLICATION

## Volume II of V

### RIPOGENUS HYDROELECTRIC PROJECT (FERC NO. 2572)

### PENOBSCOT MILLS HYDROELECTRIC PROJECT (FERC NO. 2458)



**GREAT LAKES HYDRO AMERICA, LLC**
**Millinocket, Maine**

**September 30, 2024**

**RIPOGENUS HYDROELECTRIC PROJECT (FERC NO. 2572)**

**PENOBSCOT MILLS HYDROELECTRIC PROJECT (FERC NO. 2458)**

# FINAL LICENSE APPLICATION
## Volume II of V

## APPENDIX E.1 – CORRESPONDENCE LOG

# APPENDIX E.1

# CORRESPONDENCE LOG

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**Ripogenus Hydroelectric Project (FERC No. 2572)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458)**
**FERC Relicensing Correspondence Log**

| DATE | TYPE | FROM | TO | SUBJECT |
|---|---|---|---|---|
| June 11, 2021 | Letter | GLHA | FERC | Filing of PAD/NOI |
| June 14, 2021 | Email | Houlton Band of Maliseet Indians | HDR | Comments on PAD, SD1, and/or Study Requests |
| June 29, 2021 | Letter | Maine Historic Preservation Commission (MHPC) | HDR | Initiation of Section 106 of the National Historic Preservation Act Consultation |
| July 8, 2021 | Telephone Memo | FERC | Public Files (Penobscot Mills) | FERC tribal consultation |
| July 8, 2021 | Telephone Memo | FERC | Public Files (Ripogenus) | FERC tribal consultation |
| August 10, 2021 | Letter | FERC | GLHA | Scoping Document 1 (SD1) |
| August 10, 2021 | Letter | FERC | GLHA | Notice of NOI-PAD Filing, Notice of Virtual Scoping Meetings and Site Review, and Request for Comments on PAD, SD1 and Study Requests |
| August 18, 2021 | eComment | Stephen Condren | FERC | Comments on PAD, SD1, and/or Study Requests |
| August 30, 2021 | Letter | MHPC | FERC | Comment on SD1 |
| September 9, 2021 | eComment | Amanda Swanberg | FERC | Comments on PAD, SD1, and/or Study Requests |
| September 9, 2021 | Transcript | FERC | Public Files | Transcript of the 09/09/2021 Morning Virtual Scoping Meeting |
| September 9, 2021 | Transcript | FERC | Public Files | Transcript of the 09/09/2021 Evening Virtual Scoping Meeting |

**Ripogenus Hydroelectric Project (FERC No. 2572)**
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**FERC Relicensing Correspondence Log**

| DATE | TYPE | FROM | TO | SUBJECT |
|---|---|---|---|---|
| September 13, 2021 | Letter | National Marine Fisheries Service (NMFS) | FERC | Request for Additional Information and Extension of Time (EOT) to file Comments and Study Requests |
| September 13, 2021 | Letter | Penobscot Indian Nation (PIN) | FERC | Request for Additional Information and EOT Request to file Comments and Study Requests |
| September 14, 2021 | Letter | U.S. Fish and Wildlife Service (USFWS) | FERC | Request for Additional Information and EOT Request to file Comments and Study Requests |
| September 15, 2021 | Letter | MDMR | FERC | Request for Additional Information and EOT Request to file Comments and Study Requests |
| September 16, 2021 | Letter | TU | FERC | Comments on PAD, SD1, and/or Study Requests |
| September 17, 2021 | Letter | GLHA | FERC | Response to Stakeholder Requests for Additional Information and an EOT to File Study Requests and Comments on the PAD |
| September 17, 2021 | Letter | MDIFW | FERC | Request for Additional Information and EOT Request to file Comments and Study Requests |
| September 22, 2021 | eComment | Benjamin Koehler | FERC | Comments on PAD, SD1, and/or Study Requests |
| September 22, 2021 | eComment | Joshua Firmin | FERC | Comments on PAD, SD1, and/or Study Requests |

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| DATE | TYPE | FROM | TO | SUBJECT |
|---|---|---|---|---|
| September 22, 2021 | eComment | Tom Janelle | FERC | Comments on PAD, SD1, and/or Study Requests |
| September 23, 2021 | eComment | Alec Jansujwicz | FERC | Comments on PAD, SD1, and/or Study Requests |
| September 23, 2021 | eComment | Karl Koehler | FERC | Comments on PAD, SD1, and/or Study Requests |
| September 24, 2021 | Letter | GLHA | FERC | Supplemental Information – Source Information and Existing Studies |
| September 28, 2021 | Letter | FERC | FERC Service List | Response to EOT and Additional Public Meeting Requests and Request for Information |
| September 28, 2021 | eComment | James Lepage | FERC | Comments on PAD, SD1, and/or Study Requests |
| September 29, 2021 | eComment | Charles Paone | FERC | Comments on PAD, SD1, and/or Study Requests |
| September 30, 2021 | Letter | GLHA | FERC | Supplemental Information – Virtual Site Review Information and Responses to Stakeholder Questions |
| October 1, 2021 | Letter | Edward Spear | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 1, 2021 | Email (eFiled) | NMFS | FERC | Comment on Scoping Meeting |
| October 2, 2021 | Letter | Kathleen Houston | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 2, 2021 | Letter | TU | FERC | Preliminary Comments on PAD/NOI |
| October 4, 2021 | eComment | Owen Genest | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 5, 2021 | Letter | GLHA | FERC | Comments on SD1 |

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| DATE | TYPE | FROM | TO | SUBJECT |
|---|---|---|---|---|
| October 5, 2021 | eComment | Ryan Gerry | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 6, 2021 | Photos | Michael Forti | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 6, 2021 | eComment | Peter Forti | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 7, 2021 | eComment | Alexandra Horne | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 7, 2021 | eComment | Andrew Taber | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 7, 2021 | Letter | Allagash Gateway Campground | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 7, 2021 | eComment | Benjamin Koehler | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 7, 2021 | Letter | Caribou and Chesuncook Lake Camp Owners Association (CCLCOA), Chesuncook Dam Camp Owners Association (CDCOA) | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 7, 2021 | eComment | Earle Fayle | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 7, 2021 | Letter | Jeff Fayle | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 7, 2021 | Letter | USFWS | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 7, 2021 | eComment | Emelie Ferland | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 7, 2021 | Letter | Wesley Zemrak | FERC | Comments on PAD, SD1, and/or Study Requests |

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| DATE | TYPE | FROM | TO | SUBJECT |
|---|---|---|---|---|
| October 8, 2021 | Letter | AW, AMC | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 8, 2021 | eComment | Beckham Bayreuther | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 8, 2021 | eComment | Christopher Howe | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 8, 2021 | Letter | FERC | GLHA | Comments on PAD and Preliminary Study Proposals |
| October 8, 2021 | eComment | Jacob Risch | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 8, 2021 | eComment | Miles Puleio | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 8, 2021 | eComment | Michael Smith | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 8, 2021 | Letter | MDACF | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 8, 2021 | Letter | MDEP | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 8, 2021 | Letter | MDIFW | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 8, 2021 | Letter | MDMR | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 8, 2021 | Letter | NMFS | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 8, 2021 | eComment | Paul Johnson | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 8, 2021 | eComment | Sarah Sindo | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 09, 2021 | eComment | Brendan Alterio | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 9, 2021 | eComment | Chad McLaughlin | FERC | Comments on PAD, SD1, |

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| DATE | TYPE | FROM | TO | SUBJECT |
|---|---|---|---|---|
| | | | | and/or Study Requests |
| October 9, 2021 | eComment | Douglas Binder | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 9, 2021 | eComment | E. Drew Fayle | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 9, 2021 | eComment | Gregory Friel | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 9, 2021 | eComment | Michael Hudson | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 9, 2021 | eComment | Robert Vadas | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 9, 2021 | Letter | TU | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 10, 2021 | Letter | Edward Spear | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 12, 2021 | Letter | PIN | FERC | Comments on PAD, SD1, and/or Study Requests |
| October 14, 2021 | Letter | GLHA | FERC | Comment on TU Minimum Flow Complaint |
| October 28, 2021 | Letter | Edward Spear | FERC | Comments on PAD, SD1, and/or Study Requests |
| November 9, 2021 | Letter | Edward Spear | FERC | Comments on PAD, SD1, and/or Study Requests |
| November 22, 2021 | Letter | FERC | Brookfield | Scoping Document 2 (SD2) |
| November 22, 2021 | Letter | GLHA | FERC | Filing of Proposed Study Plan (PSP) |
| November 29, 2021 | Letter | Edward Spear | FERC | Comments on SD2 |
| December 3, 2021 | Letter | Edward Spear | FERC | Comments on PSP |
| December 6, 2021 | Letter | Edward Spear | FERC | Comments on SD2 |
| December 8, 2021 | Letter | GLHA | FERC | PSP Meeting Agenda |
| December 15, 2021 | eComment | Charles Paone | FERC | Comments on PSP |

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| DATE | TYPE | FROM | TO | SUBJECT |
|---|---|---|---|---|
| December 20, 2021 | eComment | David Ahola | FERC | Comments on West Branch fishery |
| December 20, 2021 | Letter | GLHA | FERC | Copy of Proposed Study Plan Meeting Presentation |
| January 5, 2022 | Letter | TU | FERC | Report for Low Flow Events |
| January 7, 2022 | Letter | Edward Spear | FERC | Comments on GLHA's Proposed Study Plan Meeting Presentation |
| January 27, 2022 | Letter | Edward Spear | FERC | Study Request |
| January 28, 2022 | eComment | Katie Stopera | FERC | General Comments |
| January 28, 2022 | eComment | Peter Stopera | FERC | General Comments |
| January 28, 2022 | eComment | Terry Stopera | FERC | General Comments |
| February 2, 2022 | Letter | MHPC | FERC | Clarification of Previous Comments |
| February 10, 2022 | Letter | TU, AW, AMC, CCLCOA, CDCOA, AGC, AECC | FERC | PSP Comments |
| February 13, 2022 | Letter | Edward Spear | FERC | Study Request |
| February 14, 2022 | eComment | Charles Paone | FERC | General Comments |
| February 17, 2022 | eComment | Jimmy Busque | FERC | General Comments |
| February 17 2022 | Letter | NMFS | FERC | Comments on PSP |
| February 18, 2022 | Letter | AW, AMC | FERC | Comments on PSP |
| February 18, 2022 | eComment | Bill Houston, CCLCOA, CDCOA | FERC | Comments on PSP |
| February 18, 2022 | eComment | Michael Smith | FERC | Comments on PSP |
| February 18, 2022 | eComment | Sharon Klein | FERC | Comments on PSP |
| February 19, 2022 | eComment | Benjamin Koehler | FERC | Comments on PSP |
| February 20, 2022 | eComment | Christopher Howe | FERC | Comments on PSP |
| February 20, 2022 | eComment | Susan Adams | FERC | Comments on PSP |
| February 21, 2022 | Letter | Edward Spear | FERC | Comments on PSP |

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| DATE | TYPE | FROM | TO | SUBJECT |
|---|---|---|---|---|
| February 21, 2022 | Letter | TU | FERC | Comments on PSP |
| February 21, 2022 | Letter | MDEP | FERC | Comments on PSP |
| February 22, 2022 | Letter | ASF | FERC | Comments on PSP |
| February 22, 2022 | Letter | MDACF | FERC | Comments on PSP |
| February 22, 2022 | Letter | MDIFW | FERC | Comments on PSP |
| February 22, 2022 | Letter | MDMR | FERC | Comments on PSP |
| February 22, 2022 | Letter | PIN | FERC | Comments on PSP |
| February 22, 2022 | Letter | USFWS | FERC | Comments on PSP |
| February 24, 2022 | eComment | Elora Way | FERC | Comments on PSP |
| February 28, 2022 | Letter | Edward Spear | FERC | Comments on PSP |
| March 2, 2022 | Letter | USEPA | FERC | Comment Regarding Tribal Nation Concerns |
| March 7, 2022 | eComment | Elbridge Cleaves | FERC | General Comments |
| March 7, 2022 | eComment | Edward Spear | FERC | General Comments |
| March 9, 2022 | Letter | Edward Spear | FERC | Comment on West Branch Flows |
| March 13, 2022 | Letter | Kathleen Houston | FERC | Comment on GLHA's Letter regarding Minimum Flow Reductions |
| March 19, 2022 | Letter | TU | FERC | FERC's Letter regarding Minimum Flow Deviations |
| March 23, 2022 | eComment | Greg Labonte | FERC | General Comments |
| March 23, 2022 | Letter | GLHA | FERC | Filing of Revised Study Plan (RSP) |
| March 31, 2022 | Letter | NMFS | FERC | Comments on RSP |
| April 1, 2022 | Letter | AW, AMC | FERC | Comments on RSP |
| April 4, 2022 | eComment | Benjamin Koehler | FERC | Comments on RSP |
| April 7, 2022 | Letter | CCLCOA, CDCOA | FERC | Comments on RSP |
| April 7, 2022 | Letter | Edward Spear | FERC | Comments on RSP |

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| DATE | TYPE | FROM | TO | SUBJECT |
|---|---|---|---|---|
| April 7, 2022 | Letter | FERC | NMFS | Approval of EOT for RSP Comments |
| April 7, 2022 | Letter | MDACF | FERC | Comments on RSP |
| April 7, 2022 | Letter | MDEP | FERC | Comments on RSP |
| April 7, 2022 | Letter | MDIFW | FERC | Comments on RSP |
| April 7, 2022 | Letter | TU | FERC | Comments on RSP |
| April 7, 2022 | Letter | USFWS | FERC | Comments on RSP |
| April 13, 2022 | eComment | Kate McArthur | FERC | Comments on RSP |
| April 14, 2022 | eComment | Charles Watkins | FERC | Comments on RSP |
| April 14, 2022 | eComment | Ryan Waterhouse | FERC | Comments on RSP |
| April 16, 2022 | eComment | Brooks Cannon | FERC | Comments on RSP |
| April 16, 2022 | eComment | Brian Olas | FERC | Comments on RSP (1 of 2) |
| April 16, 2022 | eComment | Brian Olas | FERC | Comments on RSP (2 of 2) |
| April 16, 2022 | eComment | Nathan Warren | FERC | Comments on RSP |
| April 17, 2022 | eComment | Christopher Howe | FERC | Comments on RSP |
| April 18, 2022 | eComment | Casey Tull | FERC | Comments on RSP |
| April 18, 2022 | eComment | Dan Bernard | FERC | Comments on RSP |
| April 21, 2022 | Letter | Edward Spear | FERC | Comments on RSP |
| April 24, 2022 | eComment | Alexander Tragakes | FERC | Comments on RSP |
| April 24, 2022 | eComment | Christopher Howe | FERC | Comments on RSP |
| April 25, 2022 | Letter | Edward Spear | FERC | Comments on RSP |
| April 25, 2022 | eComment | Jesika Lucarelli | FERC | Comments on RSP |
| April 25, 2022 | eComment | Ryan Reed | FERC | Comment on RSP |
| April 26, 2022 | eComment | Benjamin Koehler | FERC | Comments on RSP |
| April 27, 2022 | Letter | Edward Spear | FERC | Comments on RSP |
| April 27, 2022 | Letter | GLHA | FERC | Response to RSP Comments |
| April 27, 2022 | Letter | Kathleen Houston | FERC | Comments on RSP |
| April 27, 2022 | Letter | NMFS | FERC | Comments on RSP |
| April 28, 2022 | eComment | Alexander Kerney | FERC | Comments on RSP |
| April 28, 2022 | eComment | Cory N/A | FERC | Comments on RSP |

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| DATE | TYPE | FROM | TO | SUBJECT |
|---|---|---|---|---|
| April 28, 2022 | eComment | Doug Kranich | FERC | Comments on RSP |
| April 28, 2022 | eComment | Gregory Friel | FERC | Comments on RSP |
| April 28, 2022 | eComment | Jacob Risch | FERC | Comments on RSP |
| April 28, 2022 | eComment | Joyce Smith | FERC | Comments on RSP |
| April 28, 2022 | eComment | Jessica Sterling | FERC | Comments on RSP |
| April 28, 2022 | eComment | Mary Haley | FERC | Comments on RSP |
| April 28, 2022 | eComment | Matthew Melcher | FERC | Comments on RSP |
| April 28, 2022 | Letter | MEPRO | FERC | Comments on RSP |
| April 28, 2022 | eComment | Robin Nesbeda | FERC | Comments on RSP |
| May 5, 2022 | Letter | Edward Spear | FERC | Comments on RSP |
| May 9, 2022 | Letter | Edward Spear | FERC | Comments on Flow Excursions |
| May 12, 2022 | Letter | TU | FERC | Comments on Flow Excursions |
| May 13, 2022 | Letter | FERC | GHLA | Final SPD |
| May 16, 2022 | Letter | Edward Spear | FERC | Comments on Final SPD |
| May 18, 2022 | Letter | Edward Spear | FERC | Comments on Final SPD |
| May 20, 2022 | Letter | Edward Spear | FERC | Comments on Article 406 Violations |
| May 24, 2022 | Letter | TU | FERC | Response to GLHA Filing on Minimum Flows |
| May 26, 2022 | Letter | FERC | GLHA | Request for Additional Information regarding minimum flows |
| May 31, 2022 | Letter | Edward Spear | FERC | Comments on Article 406 Violations |
| June 8, 2022 | Letter | GLHA | FERC | Response to minimum flow complaints |
| June 8, 2022 | eComment | Jeff Kaine | FERC | General Comments |

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| DATE | TYPE | FROM | TO | SUBJECT |
|---|---|---|---|---|
| June 13, 2022 | Letter | GHLA | FERC | Flow and water level modifications due to flashboard losses and repairs |
| June 16, 2022 | Letter | GHLA | FERC | Status update on corrective actions |
| June 17, 2022 | Letter | Edward Spear | FERC | Comments on GLHA response to FERC's Additional Information Request |
| June 27, 2022 | Data | N/A | N/A | Information regarding flows |
| June 27, 2022 | Letter | Kathleen Houston | FERC | Minimum Flows |
| June 27, 2022 | eComment | Sarah Sindo | FERC | General Comments |
| June 29, 2022 | eComment | Julie Puleio | FERC | General Comments |
| July 23, 2022 | eComment | Paul Heinze | FERC | General Comments |
| July 29, 2022 | Letter | GLHA | FERC | First Study Progress Report |
| September 21, 2022 | Letter | Edward Spear | FERC | Comments on Draft Fish Stranding Study Plan |
| September 22, 2022 | eComment | Todd Mercer | FERC | Comment on Water Management Practices |
| September 23, 2022 | eComment | Jeffrey Scott Murphy | FERC | Comments on Draft Fish Stranding Study Plan |
| September 23, 2022 | Letter | TU | FERC | Comments on Draft Fish Stranding Study Plan |
| September 25, 2022 | Letter | Edward Spear | FERC | Comment on McKay Station Maintenance Plans |
| October 19, 2022 | Letter | TU | FERC | Stranding Study of West Branch of the Penobscot River below McKay Station – Report Observations |
| November 1, 2022 | Letter | GLHA | FERC | Second Study Progress Report |

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| DATE | TYPE | FROM | TO | SUBJECT |
|---|---|---|---|---|
| November 2, 2022 | Letter | Edward Spear | FERC | Comment on Fish Stranding Study |
| November 15, 2022 | Letter | USFWS | FERC | Downstream Eel Passage Standard – Maine |
| January 4, 2023 | Letter | GLHA | FERC | Proposed Modification to Relicensing Schedule |
| January 18, 2023 | Letter | Edward Spear | FERC | Comments on Proposed Modification to Relicensing Schedule |
| January 27, 2023 | Letter | GLHA | FERC | Request for Modified ILP Schedule |
| February 16, 2023 | Order | FERC | GLHA | Order Granting EOT Request for Recreation Monitoring and Reporting |
| February 17, 2023 | Letter | FERC | GLHA | Approval and Comments on Modified ILP Schedule |
| March 28, 2023 | Letter | GLHA | FERC | Clarification of FERC's Request for EOT to File Recreation Monitoring Reports |
| April 5, 2023 | Letter | Edward Spear | FERC | Comments on EOT Request for Recreation Report |
| April 7, 2023 | Letter | GLHA | FERC | Notice of ISR Meeting |
| April 17, 2023 | Letter | FERC | Stakeholders | Notice of Environmental Site Review |
| April 24, 2023 | Letter | GLHA | FERC | Filing of Initial Study Report (ISR) |
| May 22, 2023 | Letter | GLHA | FERC | Filing of ISR Meeting Summary |

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| DATE | TYPE | FROM | TO | SUBJECT |
|---|---|---|---|---|
| May 23, 2023 | Letter | NMFS | FERC | EOT Request for ISR Comments and Study Requests |
| June 2, 2023 | Letter | Edward Spear | FERC | Comments on ISR |
| June 2, 2022 | Letter | Edward Spear | FERC | Comments on ISR |
| June 6, 2023 | Letter | FERC | GLHA | EOT to File Comments on the ISR |
| June 20, 2023 | Letter | CCLCOA, CDCOA | FERC | Comments on Environmental Inspection Report |
| June 26, 2023 | Letter | Edward Spear | FERC | Comments on ISR Appendix D |
| June 29, 2023 | Letter | MDIFW | FERC | Comments on ISR |
| July 4, 2023 | Letter | Edward Spear | FERC | Comments on ISR |
| July 5, 2023 | Letter | AW-AMC | FERC | Comments on ISR |
| July 5, 2023 | Letter | TU | FERC | Comments on ISR |
| July 6, 2023 | eComment | Christopher Howe | FERC | Comments on ISR |
| July 6, 2023 | Letter | Edward Spear | FERC | Comments on ISR |
| July 6, 2023 | Letter | Edward Spear | FERC | Comments on ISR |
| July 6, 2023 | Letter | FERC | GLHA | Comments on ISR |
| July 6, 2023 | Letter | MDACF | FERC | Comments on ISR |
| July 6, 2023 | Letter | MDMR | FERC | Comments on ISR |
| July 6, 2023 | Letter | MEPRO | FERC | Comments on ISR |
| July 9, 2023 | Letter | Edward Spear | FERC | Comments on Outage |
| July 10, 2023 | eComment | NMFS | FERC | Comments on ISR |
| July 20, 2023 | Letter | Edward Spear | FERC | Comments on ISR |
| July 25, 2023 | Letter | TU | FERC | Comments on Flow Excursion Report |
| July 28, 2023 | Letter | Edward Spear | FERC | Comments on Flow Excursion Report |
| August 1, 2023 | Letter | GLHA | FERC | Third Study Progress Report |

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| DATE | TYPE | FROM | TO | SUBJECT |
|---|---|---|---|---|
| August 2, 2023 | eComment | Henry Mitchell | FERC | General Comments |
| August 7, 2023 | Letter | GLHA | FERC | Responses to Comments on ISR and Requests for New or Amended Studies |
| August 10, 2023 | Letter | Edward Spear | FERC | Comments on Initial Water Quality Study |
| August 14, 2023 | Letter | Edward Spear | FERC | Comments on ISR and Requests for New or Amended Studies |
| August 14, 2023 | Letter | Edward Spear | FERC | Comments on Flow Deviations filed August 11, 2023 |
| August 17, 2023 | Letter | Edward Spear | FERC | Comments on GLHA response to requested studies. |
| August 25, 2023 | Letter | MDIFW | FERC | Response to GLHA's Comments on ISR and Requests for New or Amended Studies |
| August 30, 2023 | Letter | GLHA | FERC | Response to MDIFW's Comments on Umbazooksus Lake Mitigation Evaluation Study Plan |
| September 19, 2023 | Letter | FERC | GLHA | Determination on Requests for Study Modifications and New Studies |
| September 26, 2023 | Letter | Edward Spear | FERC | Comments on FERC's Determination on Requests for Study Modifications and New Studies |
| September 29, 2023 | Letter | Edward Spear | FERC | Comments on Landlock Salmon in the West Branch |

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| DATE | TYPE | FROM | TO | SUBJECT |
|---|---|---|---|---|
| October 2, 2023 | Letter | Jeffrey L. Fayle | FERC | Aesthetics Study Focus Group Comments |
| October 12, 2023 | Letter | Edward Spear | FERC | Comments on FERC's Determination on Requests for Study Modifications and New Studies |
| October 13, 2023 | Letter | Edward Spear | FERC | Comments on flow deviations |
| October 20, 2023 | eComment | William Cushing | FERC | General Comments |
| October 26, 2023 | Letter | GLHA | FERC | Notice of Operations Model Technical Workshop |
| November 1, 2023 | Letter | GLHA | FERC | Fourth Study Progress Report |
| November 6, 2023 | Letter | Edward Spear | FERC | Comment on ISR |
| November 8, 2023 | Letter | Edward Spear | FERC | Comments on Operations Model Workshop |
| November 9, 2023 | Letter | TU | FERC | Request and Concerns regarding the Determination on Requests for Study Modifications and New Studies |
| November 13, 2023 | Letter | GLHA | FERC | Letter on Updated Notice of Operations Model Technical Workshop |
| November 17, 2023 | Letter | Edward Spear | FERC | Comments on Operational Model Technical Workshop |
| December 19, 2023 | Letter | GLHA | TU | Response to TU's Request |
| January 5, 2024 | Letter | TU | FERC | Response to Brookfield's Comments on TU's Request and Concerns regarding the Determination on Requests for |

**Ripogenus Hydroelectric Project (FERC No. 2572)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458)**
**FERC Relicensing Correspondence Log**

| DATE | TYPE | FROM | TO | SUBJECT |
|---|---|---|---|---|
| | | | | Study Modifications and New Studies |
| January 8, 2024 | Letter | GLHA | FERC | Operations Model Technical Workshop Postponement Notice |
| January 16, 2024 | Letter | GLHA | FERC | Rescheduled Operations Model Technical Workshop Notification |
| January 21, 2024 | Letter | Edward Spear | FERC | Comments on TU's Response to GLHA's December 19, 2023, filing and Workshop |
| January 23, 2024 | Letter | GLHA | FERC | Operations Model Technical Workshop – Virtual Option |
| January 25, 2024 | Letter | Philip Hulbert | FERC | Comments on Historic and Contemporary Salmon Fishing Quality in the West Branch |
| February 1, 2024 | Letter | Philip Hulbert | FERC | Support for Installation of a Stream Flow Monitoring Gauge for the West Branch |
| February 2, 2024 | Letter | GLHA | FERC | Fifth Study Progress Report |
| February 5, 2024 | Letter | GLHA | FERC | Operations Model Workshop Follow-up |
| February 9, 2024 | Letter | Philip Hulbert | FERC | Comments on Interim Aquatic Resources Protection Plan during McKay Station Outages |
| February 9, 2024 | Letter | Edward Spear | FERC | Study Request |
| February 14, 2024 | Letter | Philip Hulbert | FERC | Comments on the Importance of Sport Fishing on the West Branch |

**Ripogenus Hydroelectric Project (FERC No. 2572)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458)**
**FERC Relicensing Correspondence Log**

| DATE | TYPE | FROM | TO | SUBJECT |
|---|---|---|---|---|
| February 22, 2024 | Letter | Philip Hulbert | FERC | Comments on Flow Data in West Branch |
| March 4, 2024 | Letter | Philip Hulbert | FERC | Comments on Flow Data in West Branch |
| March 4, 2024 | Letter | Michael J. Hudson | FERC | Alternative Operating Scenario Request |
| March 5, 2024 | Letter | AW, TU, AMC, CCLCOA, Chesuncook Village Association, CDCOA | FERC | Alternative Operating Scenarios Request |
| March 5, 2024 | Letter | MDEP | FERC | Alternative Operating Scenarios Request |
| March 6, 2024 | Letter | MDIFW | FERC | Alternative Operating Scenarios Request |
| March 6, 2024 | Letter | MPRO | FERC | Comments on Request for Operations Model Run |
| March 6, 2024 | Letter | USFWS | FERC | Alternative Operating Scenarios Request |
| March 13, 2024 | Letter | William Cushing | FERC | Alternative Operating Scenarios Request |
| March 25, 2024 | Letter | GLHA | FERC | USR Meeting Notification and Request for EOT |
| April 2, 2024 | Letter | FERC | GLHA | Approve EOT to for USR Meeting and USR Meeting Summary |
| April 16, 2024 | Letter | Philip Hulbert | FERC | Comments on flow modeling requests |
| April 22, 2024 | USR | GLHA | FERC | Filing of Updated Study Report |
| May 1, 2024 | Letter | Edward Spear | FERC | Comments on Proposed Ramping Study Plan |

**Ripogenus Hydroelectric Project (FERC No. 2572)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458)**
**FERC Relicensing Correspondence Log**

| DATE | TYPE | FROM | TO | SUBJECT |
|---|---|---|---|---|
| May 3, 2024 | DLA | GLHA | FERC | Draft License Application |
| May 3, 2024 | Letter | GLHA | FERC | Response to Stakeholder-Requested Alternative Operating Scenarios |
| May 3, 2024 | Letter | GLHA | FERC | Supplement to the USR |
| May 8, 2024 | Letter | Edward Spear | FERC | Response to Stakeholder-Requested Alternative Operating Scenarios |
| May 9, 2024 | Letter | Edward Spear | FERC | Comments on the North Twin Tributary Access Study Report Appendix E-7 of the Final Study Report |
| May 14, 2024 | Letter | FERC | Penobscot Indian Nation (PIN) | Communication with the Penobscot Indian Nation |
| May 23, 2024 | Letter | Edward Spear | FERC | Comments on USR Meeting; McKay Station Spawning and Incubation Flow of 1,422cfs |
| May 29, 2024 | eComment | Jeffrey Norment | FERC | Comments on McKay Station Water Management Consistency |
| May 31, 2024 | Letter | GLHA | FERC | USR Meeting Summary |
| June 5, 2024 | Letter | TU | FERC | Comments on Status of Consultation for Studies for the Ripogenus Project and the Penobscot Mills Project |
| June 14, 2024 | Letter | FERC | GLHA | Comments on USR and USR Meeting. |
| June 20, 2024 | Letter | Edward Spear | FERC | Comments on GLHA's Supplement to USR |
| June 24, 2024 | Letter | AW/AMC | FERC | Comments on the USR |
| June 24, 2024 | Letter | CCLCA / CDCA /CVA | FERC | Comments on the USR |

**Ripogenus Hydroelectric Project (FERC No. 2572)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458)**
**FERC Relicensing Correspondence Log**

| DATE | TYPE | FROM | TO | SUBJECT |
|---|---|---|---|---|
| June 26, 2024 | Letter | Edward Spear | FERC | Response to FERC's AIR |
| June 27, 2024 | Letter | George Forgette | FERC | Comments on Fish and Macroinvertebrate Density within the West Branch |
| June 27, 2024 | Letter | MDIFW | FERC | Comments on USR |
| June 28, 2024 | Letter | GLHA | FERC | USR Supplement |
| June 28, 2024 | Letter | MDACF | FERC | Comments on USR and USR Meeting Summary |
| June 30, 2024 | Letter | MEPRO | FERC | Comments on USR |
| July 1, 2024 | Letter | Christopher Howe | FERC | Comments on Current Project Operations |
| July 1, 2024 | Letter | TU | FERC | Comments on USR |
| July 2, 2024 | Email | PIN | FERC | Contact Information of Dan McCaw (PIN) for GLHA |
| July 13, 2024 | Letter | Edward Spear | FERC | Comments on USR Supplement Filing |
| July 16, 2024 | eComment | Taft Sibley | FERC | Comments on Whitewater Flows |
| July 19, 2024 | Letter | Edward Spear | FERC | Comments on Landlocked Salmon Age-Growth Data |
| July 22, 2024 | Supplemental Information | GLHA | FERC | Operations Model Run Results – Supplemental Information |
| July 27, 2024 | Letter | Edward Spear | FERC | Comments on Operations Model Run Supplemental Information |
| July 29, 2024 | Letter | CCLCA | FERC | Comments on the DLA |
| July 30, 2024 | Letter | GLHA | FERC | Response to Comments on the USR and Request for New or Amended Studies |
| July 31, 2024 | Letter | FERC | GLHA | Staff Comments on DLA |

**Ripogenus Hydroelectric Project (FERC No. 2572)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458)**
**FERC Relicensing Correspondence Log**

| DATE | TYPE | FROM | TO | SUBJECT |
|---|---|---|---|---|
| July 31, 2024 | Letter | MDACF | FERC | Comments on the DLA |
| August 1, 2024 | Letter | GLHA | FERC | Sixth Study Progress Report |
| August 1, 2024 | Letter | MDIFW | FERC | Comments on DLA |
| August 1, 2024 | Letter | MDMR | FERC | Comments on the DLA |
| August 1, 2024 | Letter | MPRO | FERC | Comments on DLA |
| August 1, 2024 | Letter | NGOs | FERC | Joint NGO Stakeholder Comments on DLA |
| August 2, 2024 | Letter | Christopher Howe | FERC | Comments on DLA |
| August 9, 2024 | Letter | NGOs | FERC | Joint NGO Stakeholder Comments on DLA |
| August 11, 2024 | Letter | Edward Spear | FERC | Comments and Study Request Supplemental to 20240801 Joint NGO Stakeholder Comments on DLA |
| August 16, 2024 | Letter | NGOs | FERC | Follow-on NGO Request for Ops Model Run |
| August 19, 2024 | Letter | Philip Hulbert | FERC | Comments on the DLA |
| August 22, 2024 | Letter | Edward Spear | FERC | A Rebuttal of Fish and Aquatic Communities Information Presented in the August 16, 2024 NGO Requests for Operations Model Runs |
| August 23, 2024 | eComment | Sarah Sindo | FERC | Comments on Public Safety Measures |
| September 3, 2024 | Letter | CCLCA | FERC | Comments on the USR |
| September 5, 2024 | Letter | FERC | GLHA | Determination on Requests for Study Modifications and New Studies |
| September 9, 2024 | Letter | TU | FERC | Report of Observations of Study Events |

**Ripogenus Hydroelectric Project (FERC No. 2572)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458)**
**FERC Relicensing Correspondence Log**

| DATE | TYPE | FROM | TO | SUBJECT |
|---|---|---|---|---|
| September 12, 2024 | Letter | Edward Spear | FERC | Comments on FERC's Determination on Requests for Study Modifications and New Studies |
| September 14, 2024 | Letter | CCLCA | FERC | Second Request for Operations Model Run |

June 11, 2021

***Via Electronic Filing***

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458)**
**Notices of Intent to File License Application**
**and Pre-Application Document**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), a subsidiary of Brookfield Renewable and Licensee of the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458) (collectively referred to as the "Projects"), herein files with the Federal Energy Regulatory Commission (FERC or Commission) Notices of Intent (NOIs) and a Pre-Application Document (PAD) for the relicensing of the Projects. The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot Counties, Maine.

Each Project's current FERC license was issued on October 22, 1996 and expires on September 30, 2026. Accordingly, GLHA is pursuing two separate new licenses for the continued operation of the Projects through the Commission's Integrated Licensing Process (ILP).

The enclosed PAD consists of two volumes. Volume I of the PAD contains public information, and Volume II of the PAD contains single-line diagrams and detailed drawings of Project works, which are considered Controlled Unclassified Information (CUI)/Critical Energy Infrastructure Information (CEII). Pursuant to 18 Code of Federal Regulations (CFR) §388.113, GLHA requests that the Commission consider this non-public information.

Concurrent with this filing and in accordance with 18 CFR §5.5(c), GLHA is providing a copy of this letter to all parties listed in the attached distribution list. Parties with interest in the upcoming relicensing can download an electronic copy of the NOIs and PAD from FERC's eLibrary system at https://www.ferc.gov/docs-filing/elibrary.asp by conducting a search using the docket numbers p-2458 and/or p-2572. In accordance with 18 CFR §5.2, a copy of the NOIs and PAD is also available for review by appointment at GLHA's offices at 1024 Central Street, Millinocket, ME 04462. Given the restrictions associated with the ongoing COVID-19 pandemic, GLHA is

Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462
www.brookfieldrenewable.com
Tel: 207.723.4341
Fax: 207.723.3948

not providing paper copies of the NOIs or PAD to Commission Staff in the Office of Energy Projects or Office of General Counsel – Energy Projects.

In accordance with 18 CFR 5.5(e), GLHA is requesting designation as the Commission's non-federal representative for the purpose of consultation under Section 7 of the Endangered Species Act and the joint agency regulations thereunder at 50 CFR 402. GLHA also requests that FERC authorize GLHA to initiate consultation under Section 106 of the National Historic Preservation Act and the implementing regulations at 36 CFR 800.2(c)(4).

If you have any questions regarding the NOIs or PAD, please contact me by phone at (207) 775-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman
Licensing Manager
Brookfield Renewable

Attachment: NOIs and PAD for the Ripogenus and Penobscot Mills Hydroelectric Projects

cc: Distribution List

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Pre-Application Document
Distribution List

## Federal Agencies

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Francis Piccoli
Acting District Manager
Northeastern States
Bureau of Land Management
626 E. Wisconsin Avenue, Suite 200
Milwaukee, WI 53202-4617

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Kimberly Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Deborah Szaro
New England Region 1
Regional Administrator (Acting)
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Kenneth Hogan
North Atlantic-Appalachian Region Hydropower
Program Coordinator
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03301

Audrey Mayer
Supervisor
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03301

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Wendi Weber
Regional Director
Northeast Regional Office
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

## State Agencies

Amanda Beal
Commissioner
Maine Department of Agriculture, Conservation,
and Forestry
22 State House Station
Augusta, ME 04333-0021

Robert Marvinney
State Geologist
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Kathy Howatt
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Melanie Loyzim
Acting Commissioner
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Christopher Sferra
Project Manager
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Judy Camuso
Commissioner
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Patrick Keliher
Commissioner
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
101 Second Street
Hallowell, ME 04347

## Municipalities and Government Officials

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Sarah Robinson
Executive Director
Piscataquis County
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Dr. Annette Padilla, PhD
Interim Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
4 Gabriel Drive, Suite 3
Augusta, ME 04330

Jeffery Gifford
State Representative
346 Frost Street
Lincoln Center, ME 04457

Peggy Jo Stanley
State Representative
413 Turnpike Road
Medway, ME 04460

## Native American Tribes

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Marla Dana
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

John Banks
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

## Additional Parties

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Stephen Perry
Representative
Carpenters Health and Safety Fund
sperry@maine.com

Carol Blasi
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

Thomas White
GNE Holdings, L.L.C.
2275 Half Day Road, Suite 350
Bannockburn, IL 60015

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Kelly Maloney
Manager
Great Lakes Hydro America LLC
150 Main Street
Lewiston, ME 04240

John Dicentes
President
International Association of Machinists
64 Congress Street
Millinocket, ME 04462-1312

Robert Farrington
International Brotherhood of Fireman
HCR 86, Box 195
Medway, ME 04460

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Director
Maine Professional River Outfitters
PO Box 669
Millinocket, ME 04462-0669

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Eric Givens
Maine Sporting Camp Association
PO Box 119
Millinocket, ME 04462-0119

Stephen Heinz
FERC Coordinator
Maine Trout Unlimited Council
3 Spruce Lane
Cumberland Foreside, ME 04110

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Thomas Nannery
Sportsman's Alliance of Maine
RR 1 Box 1174
Augusta, ME 04330-9801

Jeffrey Reardon
Maine Brook Trout Project Director
Trout Unlimited
267 Scribner Hill Road
Manchester, ME 04351

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

| | |
|---|---|
| **From:** | Isaac St. John |
| **To:** | Russell, Cate |
| **Subject:** | RE: Ripogenus & Penobscot Mills Hydroelectric Projects: Notices of Intent to File License Application and Pre-Application Document |
| **Date:** | Monday, June 14, 2021 9:29:41 AM |

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good morning,

We do not have an immediate concern with your project or project site, and do not currently have the resources to fully investigate same. Should any human remains, archaeological properties or other items of historical importance be unearthed while working on this project, we recommend that you stop your project and report your findings to the appropriate authorities including the Houlton Band of Maliseet Indians.

Thank you,

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

---

**From:** Russell, Cate [mailto:Cate.Russell@hdrinc.com]
**Sent:** Friday, June 11, 2021 2:05 PM
**To:** abeahm@maineaudubon.org; ahamilton@eatonpeabody.com; andrew_raddant@ios.doi.gov; Audrey_Mayer@fws.gov; bigeddy@gwi.net; bob@americanwhitewater.org; brian@myexterus.com; Sojkowski, Bryan <bryan_sojkowski@fws.gov>; casey.clark@maine.gov; cblasi@clf.org; chief.wnicholas@gmail.com; chiefmdana@wabanaki.com; chris.sockalexis@penobscotnation.org; christopher.boelke <christopher.boelke@noaa.gov>; christopher.sferra@maine.gov; csabattis@maliseets.com; dacf@maine.gov; dan.mccaw@penobscotnation.org; darryl.lacounte@bia.gov; DOISOLNE-FERC@sol.doi.gov; donald.dow@noaa.gov; Douglas.Kane@maine.gov; epeterpaul@micmac-nsn.gov; fpiccoli@blm.gov; governor@maine.gov; harold.peterson@bia.gov; heinz@maine.rr.com; istjohn@maliseets.com; jana.l.jacobson@usace.army.mil; jay.l.clement@usace.army.mil; jeddins@achp.gov; jeff.murphy@noaa.gov; jeff@bloomerrussell.com; jeffery.gifford@legislature.maine.gov; jim.vogel@maine.gov; john.banks@penobscotnation.org; john.perry@maine.gov; john.spain@ferc.gov; john@asf.comcastbiz.net; jon.hare@noaa.gov; jreardon@tu.org; judy.camuso@maine.gov; julianne_rosset@fws.gov; kathleen.leyden@maine.gov; kathy.howatt@maine.gov; Hogan, Kenneth J <kenneth_hogan@fws.gov>; kevin.dunham@maine.gov; kevin@americanwhitewater.org; kevin_mendik@nps.gov; kirk.francis@penobscotnation.org; kirk.mohney@maine.gov; landis@mainerivers.org;

lumphrey@emdc.org; maine.nap@maine.gov; mainequestadventures@gmail.com; manager@millinocket.org; marchelle.foster@bia.gov; mark.caron@maine.gov; melanie.loyzim@maine.gov; michael.pentony@noaa.gov; mstreeter212@gmail.com; mzakutansky@outdoors.org; nstasuli@usgs.gov; patrick.keliher@maine.gov; peggyjo.stanley@legislature.maine.gov; richard.c.kristoff@usace.army.mil; robert.g.marvinney@maine.gov; sarah.robinson@piscataquisswcd.org; sean.m.ledwin@maine.gov; smahoney@clf.org; soctomah@gmail.com; sperry@maine.com; szaro.deb@epa.gov; tim.obrey@maine.gov; timmermann.timothy@epa.gov; wendi_weber@fws.gov
**Cc:** Dorman, Randy <randy.dorman@brookfieldrenewable.com>; Bernier, Kevin <kevin.bernier@brookfieldrenewable.com>; Maloney, Kelly <kelly.maloney@brookfieldrenewable.com>; Gibson, Jim <Jim.Gibson@hdrinc.com>; Wendy Bley <wendy.bley@kleinschmidtgroup.com>
**Subject:** Ripogenus & Penobscot Mills Hydroelectric Projects: Notices of Intent to File License Application and Pre-Application Document

Dear Stakeholders –

The Ripogenus Hydroelectric Project (FERC No. 2572) and the Penobscot Mills Hydroelectric Project (FERC No. 2458), located on the West Branch of the Penobscot River in Piscataquis and Penobscot Counties, Maine, are currently licensed with the Federal Energy Regulatory Commission (FERC). The licensee, Great Lakes Hydro America, LLC (GLHA), a subsidiary of Brookfield Renewable, has begun the federal relicensing process by filing Notices of Intent to File License Application (NOIs) and a Pre-Application Document (PAD) for these facilities.

On behalf of GLHA, attached is the transmittal for these documents, which provides instructions as to how to obtain a copy of the NOIs and PAD from FERC's eLibrary system at https://elibrary.ferc.gov/idmws/search/fercgensearch.asp.

Given that our contact database includes your email address, we are providing a copy of this letter via email, in lieu of a direct mailing. If you would like to receive paper copies of future letters, as compared to emails, please contact Cate Russell with HDR at cate.russell@hdrinc.com or (207) 239-3792.

If there are any questions regarding this email, the attachment, or the NOIs/PAD please contact Randall Dorman with Brookfield Renewable at (207) 755-5605 or Randy.Dorman@hdrinc.com or Jim Gibson with HDR at (315) 414-2202 or Jim.Gibson@hdrinc.com.

Sincerely,

**Cate Russell**
*Regulatory and Environmental Section Manager*

**HDR**
970 Baxter Blvd, Suite 301
Portland, ME 04103
**D** 207.239.3792 **M** 617.803.2733
cate.russell@hdrinc.com

hdrinc.com/follow-us

MAINE HISTORIC PRESERVATION COMMISSION
55 CAPITOL STREET
65 STATE HOUSE STATION
AUGUSTA, MAINE
04333

JANET T. MILLS
GOVERNOR

KIRK F. MOHNEY
DIRECTOR

June 29, 2021

Ms. Cate Russell
HDR
970 Baxter Blvd
Suite 301
Portland, ME 04103

Project: MHPC #1049-21 Great Lakes Hydroelectric; Ripogenus FERC 2572; Penobscot Mills FERC 2458
NOI License Application

Town: Various, ME

Dear Ms. Russell:

In response to your recent request, I have reviewed the information received June 14, 2021 to initiate consultation on the above referenced project in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended.

The area of potential effect as noted on page 5-252 is "defined as all lands and waters within the Project Boundary.... This includes the area where Project operations or Project-related recreation activities or other enhancements may cause changes in the character or use of historic properties." Based on this definition of the APE, it is unclear from the discussion in Section 5.10.2 as to whether the entire Project Boundary was surveyed for architectural resources during the prior re-licensing effort. If such a survey was not conducted, or if it needs to be updated to identify other properties that are now 50 years of age or older, the Commission recommends that the applicant undertake further studies to identify all properties in the APE that may be eligible for listing in the National Register of Historic Places.

An architectural survey is recommended to identify and record information on all resources within the area of potential effect (APE) that are at least 50 years old. Survey must be completed according to our "Revised Above Ground Cultural Resource Survey Manual Project Review Specific." All surveys must be submitted electronically via our on-line CARMA database. See our website for more information: https://www.maine.gov/mhpc/quick-links/forms-instructions

A list of historic preservation consultants who are qualified to conduct architectural survey and have been trained in the use of the CARMA database may be found at the following page of our website: https://www.maine.gov/mhpc/programs/survey/approved-consultants/carma-trained-consultants

The archaeological resources section of the PAD (pp. 5-254 through 5-268 for Ripogenus and 5-265 through 5-268 for Penobscot Mills) accurately summarized archaeological mitigation work to date on the sites listed in the HPMP for the October 1996 license. No further Phase I or Phase II archaeological survey is necessary. Mitigation archaeological work not yet completed for the 1996 license should be brought forward for an HPMP for the 2026 license. Continued analysis and reporting on excavated sites (e.g. p5-261 and 5/262) should be a priority. Attempts to access the sites that have been difficult to access because of water levels or landowner permissions should continue.

After the 1996 license, a major archaeological collection (the Dan Hurld collection) primarily from the Penobscot Mills project area was acquired by the Maine State Museum. This collection consists of over 1000

stone tools and several hundred pieces of Native American ceramics, recovered during periods of low water on the Penobscot Mills lakes by Dan Hurld between about 1930 and 1955. The artifacts are marked by site location and can be attributed to specific archaeological sites by site number. This collection will provide a major increase in cultural context (age of occupation, types of artifacts at each site) when combined with existing information from the Phase I, II and mitigation work. We request that a professional analysis of the Dan Hurld collection, and integration of the information contained within it to the known site information be undertaken and funded as part of the HPMP for the 2026 license, or as work in advance of license issuance. This is appropriate mitigation for the effects of the raised water levels on the Penobscot Mills impoundments on scores of archaeological sites around the impoundment.

If you have any questions regarding archaeology, please contact Dr. Arthur Spiess of this office at Arthur.Spiess@maine.gov.

Please contact Megan M. Rideout of our staff at 287-2992 or megan.m.rideout@maine.gov if you have any questions regarding above ground resources.

Sincerely,

Kirk F. Mohney

Kirk F. Mohney
State Historic Preservation Officer

PHONE: (207) 287-2132

FAX: (207) 287-2335

# Telephone Memo

**To:** Public Files
**From:** Dustin Wilson
**Date:** July 8, 2021
**Dockets:** P-2458-247
**Project:** Penobscot Mills Hydroelectric Project

**Subject: Consultation with Tribes for the Penobscot Mills Hydroelectric Project No. 2458-247**

On April 15, 2021, Dustin Wilson, staff of the Division of Hydropower Licensing with the Federal Energy Regulatory Commission (Commission) issued a letter initiating Tribal consultation for the licensing process for the Penobscot Mills Hydroelectric Project No. 2458 (Penobscot Mills Project). Mr. Wilson followed up with the addressed Tribes via telephone on June 10, 2021, June 16, 2021, and June 28, 2021 to determine if any would be interested in participating in consultation for the Penobscot Mills Project. Mr. Wilson followed up with Donald Soctomah of the Passamquoddy Tribe on July 8, 2021 and he stated potential concerns associated with any construction. John Dennis of the Aroostook Band of Micmacs stated on June 28, 2021 that there were no concerns. No responses were received from the Houlton Band of Maliseet or the Penobscot Indian Nation.

# Telephone Memo

**To:** Public Files
**From:** Dustin Wilson
**Date:** July 8, 2021
**Dockets:** P-2572-133
**Project:** Ripogenus Hydroelectric Project

**Subject:** **Consultation with Tribes for the Ripogenus Hydroelectric Project No. 2572-133**

On April 15, 2021, Dustin Wilson, staff of the Division of Hydropower Licensing with the Federal Energy Regulatory Commission (Commission) issued a letter initiating Tribal consultation for the licensing process for the Ripogenus Hydroelectric Project No. 2572 (Ripogenus Project). Mr. Wilson followed up with the addressed Tribes via telephone on June 10, 2021, June 16, 2021, and June 28, 2021 to determine if any would be interested in participating in consultation for the Ripogenus Project. Mr. Wilson followed up with Donald Soctomah of the Passamquoddy Tribe on July 8, 2021 and he stated potential concerns associated with any construction. John Dennis of the Aroostook Band of Micmacs stated on June 28, 2021 that there were no concerns. No responses were received from the Houlton Band of Maliseet or the Penobscot Indian Nation.

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Great Lakes Hydro America, LLC — Project Nos. 2572-133
2458-247

# NOTICE OF INTENT TO FILE LICENSE APPLICATIONS, FILING OF PRE-APPLICATION DOCUMENT, COMMENCEMENT OF PRE-FILING PROCESS, AND SCOPING; REQUEST FOR COMMENTS ON THE PAD AND SCOPING DOCUMENT, IDENTIFICATION OF ISSUES AND ASSOCIATED STUDY REQUESTS, AND VIRTUAL PUBLIC SCOPING MEETINGS AND VIRTUAL ENVIRONMENTAL SITE REVIEW

(August 10, 2021)

a. Type of Filing: Notices of Intent to File License Applications for New License and Commencing Pre-filing Process

b. Project Nos.: 2572-133 and 2458-247

c. Date Filed: June 11, 2021

d. Submitted By: Great Lakes Hydro America, LLC

e. Name of Projects: Ripogenus Hydroelectric Project and Penobscot Mills Hydroelectric Project

f. Location: On the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot Counties, Maine.

g. Filed Pursuant to: 18 CFR Part 5 of the Commission's Regulations.

h. Licensee Contact: Randall Dorman, Licensing Manager, Brookfield Renewable, 150 Main Street, Lewiston, ME 04240; (207) 755-5605; randy.dorman@brookfieldrenewable.com.

i. FERC Contact: Allan Creamer at (202) 502-8365, or e-mail at allan.creamer@ferc.gov.

j. Cooperating agencies: Federal, state, local, and tribal agencies with jurisdiction and/or special expertise with respect to environmental issues that wish to cooperate in the preparation of the environmental document should

follow the instructions for filing such requests described in item o below. Cooperating agencies should note the Commission's policy that agencies that cooperate in the preparation of the environmental document cannot also intervene. *See* 94 FERC 61,076 (2001).

k. With this notice, we are initiating informal consultation with: (a) the U.S. Fish and Wildlife Service and/or NOAA Fisheries under section 7 of the Endangered Species Act and the joint agency regulations thereunder at 50 CFR, Part 402; and (b) the State Historic Preservation Officer, as required by section 106, National Historic Preservation Act, and the implementing regulations of the Advisory Council on Historic Preservation at 36 CFR 800.2.

l. With this notice, we are designating Great Lakes Hydro America, LLC as the Commission's non-federal representative for carrying out informal consultation, pursuant to section 7 of the Endangered Species Act and section 106 of the National Historic Preservation Act.

m. Great Lakes Hydro America, LLC filed with the Commission a Pre-Application Document (PAD; including a proposed process plan and schedule), pursuant to 18 CFR 5.6 of the Commission's regulations.

n. In addition to publishing the full text of this document in the Federal Register, the Commission provides all interested persons an opportunity to view and/or print the contents via the Internet through the Commission's Home Page (http://www.ferc.gov), using the "eLibrary" link. Enter the docket number(s), excluding the last three digits in the docket number field, to access the document. At this time, the Commission has suspended access to the Commission's Public Reference Room, due to the proclamation declaring a National Emergency concerning the Novel Coronavirus Disease (COVID-19), issued by the President on March 13, 2020. For assistance, contact FERC Online Support at Mailto:FERCOnlineSupport@ferc.gov, or call toll-free, (866) 208-3676 or TYY, (202) 502-8659.

Register online at http://www.ferc.gov/docs-filing/esubscription.asp to be notified via e-mail of new filings and issuances related to these or other pending projects. For assistance, contact FERC Online Support.

o. With this notice, we are soliciting comments on the PAD and Commission staff's Scoping Document 1 (SD1), as well as study requests. All comments on the PAD and SD1, and study requests should be sent to the address above in paragraph h. In addition, all comments on the PAD and SD1, study requests, requests for cooperating agency status, and all communications to and from

Commission staff related to the merits of the potential applications must be filed with the Commission.

The Commission strongly encourages electronic filing. Please file all documents using the Commission's eFiling system at http://www/ferc.gov/docs-filing/efiling.asp. Commenters can submit brief comments up to 6,000 characters, without prior registration, using the eComment system at http://www.ferc.gov/docs-filing/ecomment.asp. You must include your name and contact information at the end of your comments. For assistance, please contact FERC Online Support at Mailto:FERCOnlineSupport@ferc.gov. In lieu of electronic filing, you may submit a paper copy. Submissions sent via the U.S. Postal Service must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 888 First Street NE, Room 1A, Washington, DC 20426. Submissions sent via any other carrier must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 12225 Wilkins Avenue, Rockville, Maryland 20852.

All filings with the Commission must bear the appropriate heading: "Comments on Pre-Application Document," "Study Requests," "Comments on Scoping Document 1," "Request for Cooperating Agency Status," or "Communications to and from Commission Staff." Any individual or entity interested in submitting study requests, commenting on the PAD or SD1, and any agency requesting cooperating status must do so by **October 9, 2021**.

p. Scoping Process

The Commission's scoping process will help determine the required level of analysis and satisfy the NEPA scoping requirements, irrespective of whether the Commission prepares an environmental assessment or Environmental Impact Statement. Due to on-going concerns with large gatherings related to COVID-19, we do not intend to hold in-person public scoping meetings or an in-person environmental site review. Rather, we will hold virtual public scoping meetings and a virtual environmental site review

Scoping Meetings

Commission staff will hold two virtual public scoping meetings. A daytime meeting will focus on concerns of resource agencies, Native American tribes, and NGOs while an evening meeting will focus on receiving input from the public. We invite all interested agencies, Native American tribes, NGOs, and individuals to attend one of these meetings to assist us in identifying the scope of environmental issues that should be analyzed in the NEPA document. The

scoping meetings will be recorded by a court reporter. All oral and written comments will become part of the Commission's public record. Oral comments will be limited to 5 minutes in duration.

| **Date and Time** |
|---|
| Meeting for resource agencies, Tribes, and NGOs<br>Thursday, September 9, 2021<br>9:00 -11:00 am EDT<br>Call in number: 888-604-9359<br>Participant passcode: 8998724 |
| Meeting for the general public<br>Thursday, September 9, 2021<br>6:30 - 8:30 pm EDT<br>Call in number: 888-604-9359<br>Participant passcode: 8998724 |

Scoping Document 1 (SD1), which outlines the subject areas to be addressed in the environmental document, was mailed to the individuals and entities on the Commission's mailing list and Great Lakes Hydro America, LLC's mailing list. Copies of SD1 may be viewed on the web at http://www.ferc.gov, using the "eLibrary" link. Follow the directions for accessing information in paragraph n. Based on all oral and written comments, a Scoping Document 2 (SD2) may be issued. SD2 may include a revised process plan and schedule, as well as a list of issues, identified through the scoping process.

Environmental Site Review

Great Lakes Hydro America, LLC and Commission staff will hold a virtual Environmental Site Review of the Ripogenus Project and the Penobscot Mills Projects on September 9, 2021, starting at 1:30 p.m. Please contact Cate Russell of HDR, Inc. at (207) 239-3792, or cate.russell@hdrinc.com, by September 3, 2021, if you plan to attend the environmental site review. WebEx meeting details will be provided by HDR staff once attendance is confirmed.

Meeting Objectives

At the scoping meetings, staff will: (1) briefly describe the relicensing process, as well as the projects and their operation; (2) initiate scoping of the issues; (3) review existing information and identify preliminary information and study needs; and (4) review the process plan and schedule for pre-filing activities. Meeting participants should come prepared to discuss their issues and/or concerns. Please review the PAD in preparation for the scoping meetings. Directions on how to obtain a copy of the PAD and SD1 are included in item n of this notice.

Kimberly D. Bose,
Secretary.

FEDERAL ENERGY REGULATORY COMMISSION
Washington, DC 20426
August 10, 2021

OFFICE OF ENERGY PROJECTS

Project Nos. 2572-133 & 2458-247 –
Maine
Ripogenus Hydroelectric Project
Penobscot Mills Hydroelectric Project
Great Lakes Hydro America, LLC

**VIA FERC Service**

**Reference: Scoping Document 1 for the Ripogenus Hydroelectric Project (P-2572-133) and Penobscot Mills Hydroelectric Project (P-2458-247)**

To the Parties Addressed:

The Federal Energy Regulatory Commission (Commission) is currently reviewing the Pre-Application Document (PAD) submitted by Great Lakes Hydro America, LLC (GLHA), a subsidiary of Brookfield Renewable, for relicensing the Ripogenus Hydroelectric Project (FERC No. 2572) and the Penobscot Mills Hydroelectric Project (FERC No. 2458) (collectively referred to as the "Projects"). The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot Counties, Maine. The Projects do not occupy any federal land.

Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended, Commission staff will prepare an environmental document (NEPA document) which will be used by the Commission to determine whether, and under what conditions, to issue a new license for the Projects. To support and assist our environmental review and determine the level of analysis needed, we are beginning the public scoping process to ensure that all pertinent issues are identified and analyzed, and that the NEPA document is thorough and balanced.

We invite your participation in the scoping process and are circulating the attached Scoping Document 1 (SD1) to provide you with information on the Projects. We are also soliciting your comments and suggestions on our preliminary list of issues and alternatives to be addressed in the NEPA document. We are requesting that you identify

any studies that would help provide a framework for collecting pertinent information on the resource areas under consideration necessary for the Commission to prepare the NEPA document for the Projects.

Due to concerns with large gatherings related to COVID-19, we do not intend to conduct in-person public scoping meetings or an in-person environmental site review. We are soliciting electronic or written comments, recommendations, and information on SD1. In lieu of sending written comments, the Commission invites you to attend one of the virtual scoping meetings its staff will conduct by telephone (*see* section 2.2, *Comments, Scoping Meetings, and Environmental Site Review* of the attached SD1).

SD1 is being distributed to GLHA's distribution list and the Commission's official mailing list (*see* section 9.0, *Mailing Lists*, of the attached SD1). If you wish to be added to, or removed from, the Commission's official mailing list, please send your request by email to Mailto:FERCOnlineSupport@ferc.gov. In lieu of an email request, you may submit a paper request. Submissions sent via the U.S. Postal Service must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 888 First Street NE, Room 1A, Washington, DC 20426. Submissions sent via any other carrier must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 12225 Wilkins Avenue, Rockville, Maryland 20852. All written or emailed requests must specify your wish to be added to, or removed from, the mailing list for the Projects, and must clearly identify **Ripogenus Hydroelectric Project (P-2572-133)** and/or **Penobscot Mills Hydroelectric Project (P-2458-247)** on the first page.

Please review SD1 and, if you wish to provide comments, follow the instructions in section 6.0, *Request for Information and Studies*. If you have any questions about SD1, the scoping process, or how Commission staff will develop the NEPA document for the Projects, please contact Allan Creamer at (202) 502-8365, or at allan.creamer@ferc.gov. Additional information about the Commission's licensing process and the project may be obtained from the Commission's website, www.ferc.gov. The deadline for filing comments is **October 9, 2021**. The Commission strongly encourages electronic filings.

Enclosure: Scoping Document 1

# SCOPING DOCUMENT 1

**RIPOGENUS HYDROELECTRIC PROJECT**
**(FERC NO. 2572-133)**
**PENOBSCOT MILLS HYDROELECTRIC PROJECT**
**(FERC NO. 2458-247)**




Federal Energy Regulatory Commission
Office of Energy Projects
Division of Hydropower Licensing
Washington, DC

August 2021

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# SCOPING DOCUMENT 1

## Ripogenus Hydroelectric Project (FERC No. 2572-133)
## Penobscot Mills Hydroelectric Project (FERC No. 2458-247)

## 1.0 INTRODUCTION

The Federal Energy Regulatory Commission (Commission or FERC), under the authority of the Federal Power Act (FPA),[1] may issue licenses for terms ranging from 30 to 50 years for the construction, operation, and maintenance of non-federal hydroelectric projects. On June 11, 2021, Great Lakes Hydro America, LLC (GLHA), filed notices of intent and a pre-application document (NOI/PAD) for new licenses for the Ripogenus Hydroelectric Project No. 2572-133 (Ripogenus Project) and the Penobscot Mills Hydroelectric Project No. 2458-247 (Penobscot Mills Project) (collectively, the "Projects"). The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot Counties, Maine (figure 1). A detailed description of the Projects is provided in section 3.0, *Proposed Actions and Alternatives*. The Projects do not occupy federal lands.

The National Environmental Policy Act (NEPA) of 1969,[2] the Commission's regulations, and other applicable laws require that we independently evaluate the environmental effects of relicensing the Projects as proposed, and consider reasonable alternatives to the proposed actions.[3] We will prepare an environmental document (NEPA document) that describes and evaluates the probable effects, if any, of the licensee's proposed actions for the Projects and alternatives to the proposed actions. The Commission's scoping process will help determine the required level of analysis and satisfy the NEPA scoping requirements, irrespective of whether the Commission issues an environmental analysis (EA) or an environmental impact statement (EIS).

[1] 16 U.S.C. § 791(a)-825(r).

[2] 42 U.S.C. §§ 4321-4370(f).

[3] The Council on Environmental Quality (CEQ) issued a final rule on July 15, 2020, revising the regulations under 40 C.F.R. Parts 1500 – 1518 that federal agencies use to implement NEPA (*see* Update to the Regulations Implementing the Procedural Provisions of the National Environmental Policy Act, 85 Fed. Reg. 43,304). The Final Rule became effective on, and applies to any NEPA process begun after, September 14, 2020. Commission staff intends to conduct its NEPA review in accordance with CEQ's new regulations.

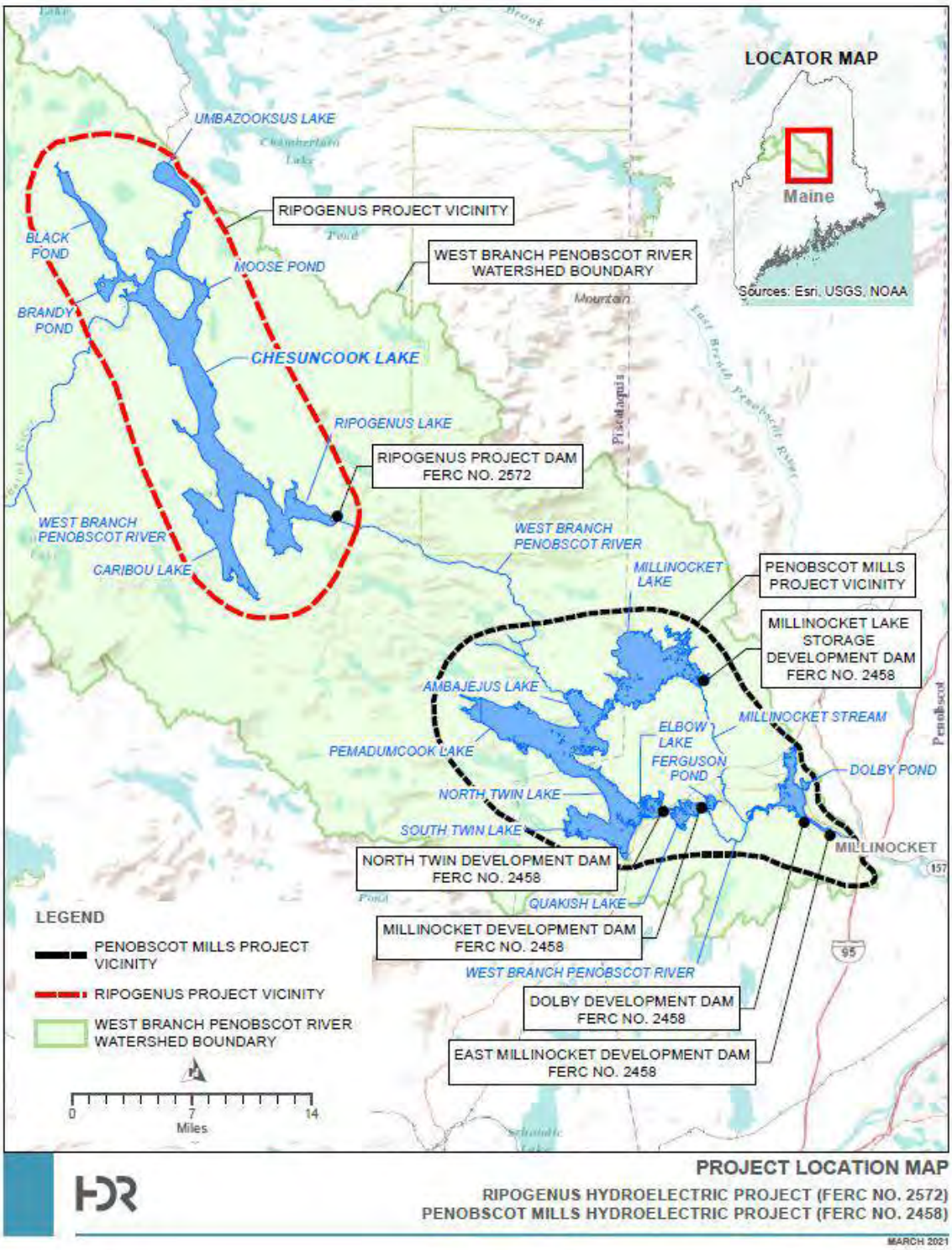



Figure 1. Location of the Ripogenus and Penobscot Mills Hydroelectric Projects (source: PAD).

# 2.0 SCOPING

This Scoping Document 1 (SD1) is intended to advise all participants as to the proposed scope of the NEPA document and to seek additional information pertinent to this analysis. This document contains: (1) a description of the scoping process and the development of the license applications; (2) a description of the licensee's proposed actions and alternatives to the proposed actions for the Projects; (3) a preliminary identification of environmental issues for the Projects; and (4) a preliminary list of comprehensive plans that are applicable to the Projects.

## 2.1 PURPOSES OF SCOPING

Scoping is the process used to identify issues, concerns, and opportunities for enhancement or mitigation associated with a proposed action. According to NEPA, the process should be conducted early in the planning stage of the project. The purposes of the scoping process are as follows:

- invite participation of federal, state and local resource agencies, Native-American tribes, non-governmental organizations (NGOs), and the public to identify significant environmental and socioeconomic issues related to the proposed Projects;

- determine the resource issues, depth of analysis, and significance of issues to be addressed in the NEPA document;

- identify reasonable alternatives to the proposed actions for the Projects that should be evaluated in the NEPA document;

- solicit available information on the resources at issue and study needs; and

- determine the resource areas and potential issues that do not require detailed analysis during review of the Projects.

## 2.2 COMMENTS, SCOPING MEETINGS, AND ENVIRONMENTAL SITE REVIEW

During preparation of the NEPA document, there will be several opportunities for the resource agencies, Native-American tribes, NGOs, and the public to provide input.

These opportunities occur:

- during the public scoping process and study plan meetings, when we solicit comments regarding the scope of issues and analysis for the NEPA document;

- in response to the Commission's notice that the Projects are ready for environmental analysis; and

- after issuance of the NEPA document when we solicit comments on the document.

Due to on-going concerns with large gatherings related to COVID-19, we do not intend to hold in-person public scoping meetings or an in-person environmental site review. We are soliciting written comments and recommendations on the preliminary list of issues and alternatives to be addressed in the NEPA document. In addition to written comments solicited by this SD1, we will hold two virtual public scoping meetings and a virtual environmental site review. A daytime meeting will focus on concerns of resource agencies, Native-American tribes, and NGOs while an evening meeting will focus on receiving input from the public. We invite all interested agencies, Native-American tribes, NGOs, and individuals to attend one of these meetings to assist us in identifying the scope of environmental issues that should be analyzed in the NEPA document. We also invite all stakeholders to attend the virtual environmental site review. Please contact Cate Russell of HDR, Inc. at (207) 239-3792, or cate.russell@hdrinc.com, by September 3, 2021, if you plan to attend the environmental site review.

The virtual scoping meetings and virtual environmental site review are scheduled as follows:

| **Date and Time** |
|---|
| Meeting for resource agencies, Tribes, and NGOs<br>Thursday, September 9, 2021<br>9:00 -11:00 am EDT<br>Call in number: 888-604-9359<br>Participant passcode: 8998724 |
| Environmental Site Review for all stakeholders<br>Thursday, September 9, 2021<br>1:30 – 3:30 pm EDT<br>WebEx meeting details provided by HDR staff |

| Date and Time |
| --- |
| Meeting for the general public<br>Thursday, September 9, 2021<br>6:30 - 8:30 pm EDT<br>Call in number: 888-604-9359<br>Participant passcode: 8998724 |

The scoping meetings will be recorded by a court reporter. All oral and written comments will become part of the Commission's public record. Oral comments will be limited to 5 minutes in duration. Interested stakeholders who choose not to speak or who are unable to attend the scoping meetings may provide written comments and information to the Commission as described in section 6.0, *Request for Information and Studies*. These meetings are posted on the Commission's calendar located on the internet at http://www.ferc.gov/EventCalendar/EventsList.aspx?View=monthview, along with other related information.

Scoping commenters should provide information on issues and/or concerns as they pertain to the proposed continued operation and maintenance of the Projects. It is advised that commenters review the PAD when preparing comments. Copies of the PAD may be viewed on the Commission's website (http://www.ferc.gov), using the "eLibrary" link. Enter docket numbers, P-2572 for the Ripogenus Project or P-2458 for the Penobscot Mills Project, to access the document. For assistance, contact FERC Online Support at Mailto:FERCOnlineSupport@ferc.gov, or toll free at 1-866-208-3676, or for TTY, (202) 502-8659. At this time, the Commission has suspended access to the Commission's Public Reference Room, due to the proclamation declaring a National Emergency concerning COVID-19 issued by the President on March 13, 2020.

Following the scoping comment period, all issues raised will be reviewed and decisions made as to the level of analysis needed. If this preliminary analysis indicates that any issues presented in this scoping document have little potential for causing significant effects, the issue(s) will be identified and the reasons for not providing a more detailed analysis will be given in the NEPA document.

Commission staff will revise this Scoping Document, as necessary, to reflect the comments received during the comment period. If we receive no substantive comments on SD1, then we will not prepare a Scoping Document 2 (SD2). Otherwise, we will issue SD2 to address any substantive comments received. The NEPA document will address recommendations and input received during the scoping process.

# 3.0 PROPOSED ACTIONS AND ALTERNATIVES

In accordance with NEPA, the environmental analysis will consider the following alternatives, at a minimum: (1) the no-action alternative; (2) the applicant's proposed actions; and (3) alternatives to the proposed actions.

## 3.1 NO-ACTION ALTERNATIVE

Under the no-action alternative, the Ripogenus Project and Penobscot Mills Project would continue to operate as required by their current project licenses (i.e., there would be no change to the existing environment). No new environmental protection, mitigation, or enhancement measures would be implemented. We use this alternative to establish baseline environmental conditions for comparison with other alternatives.

### 3.1.1 Project Facilities

*RIPOGENUS PROJECT*

The Ripogenus Project is located about 21 river miles (RM) upstream of the Penobscot Mills Project on the West Branch of the Penobscot River (West Branch), which flows into Ambajejus Lake (part of the Penobscot Mills Project's North Twin Development). The project generally consists of a dam, reservoir, intake structure, a tunnel and penstocks, powerhouse with generation equipment, and a transmission line (figure 2).[4]

Ripogenus, Caribou, and Chesuncook Lakes and Black, Brandy, and Moose Ponds constitute the Ripogenus impoundment created by Ripogenus Dam. The impoundment is about 20.8 miles long and has a surface area of approximately 29,270 acres at the normal full pond elevation of 941.59 feet United States Geological Survey (USGS) datum.[5] The impoundment's mean depth is 35.8 feet, and usable storage is about 688,705 acre-feet, with a maximum drawdown of 44 feet (to elevation 897.59 feet).[6] Ripogenus Dam, a

[4] This SD1 provides a summary of the Ripogenus Project and the Penobscot Mills Project facilities. The Ripogenus and Penobscot Mills Projects are described in greater detail in section 4.3, *Existing Project Facilities*, of the PAD.

[5] Unless otherwise noted, all elevations cited in this SD1 are in USGS datum.

[6] The Ripogenus Project also includes Umbazooksus Lake, which is a 1,600-acre former storage impoundment that is located within the project boundary. In 1998, the storage and release operations were discontinued so the current flow regime is run-of-

795-foot-long concrete and earth-filled structure, is located at the outlet of Ripogenus Lake. The dam, which crosses the West Branch in a north-south direction, includes two concrete ogee[7] spillway sections totaling about 480 feet in length, a 37-foot-long intake section, a 178-foot-long gated sluice section, and a 100-foot-long earth section.

Water flows from Ripogenus impoundment through a concrete intake structure, which is protected by trash racks with 2-5/8 inch clear spacing. The intake structure connects to 16-foot-diameter concrete-lined tunnel that is approximately 3,850 feet long and connects to three penstocks that lead to the powerhouse (McKay Station). Flows diverted to the tunnel, penstocks, and powerhouse bypass a 0.75-mile-long river reach (Upper Gorge) of the West Branch. The 130-foot-long by 45-foot-wide powerhouse contains three vertical Francis-type turbines, each connected to a generator. The rated capacity of the three turbines is 38.6 MW, and the rated capacity of the three generators is 37.5 MW. Flow from the powerhouse is conveyed back to the West Branch via a 50-foot-long excavated bedrock tailrace.

The power generated at the Ripogenus Project is transmitted to the electric grid via three transformers and transmission lines that start at the substation at McKay Station and extend about 29.4 miles to GLHA's Millinocket Substation #4 (part of the Penobscot Mills Project). An additional 0.75-mile-long transmission line extends from the McKay Substation to Ripogenus Dam to supply backup power to the gate operators and to Ripogenus Village.

The Ripogenus Project also contains one utility-scale battery energy storage site that is part of a Battery Energy Storage System at the Projects (*see* Battery Energy Storage System description for the Penobscot Mills Project).

river. Umbazooksus Lake, therefore, provides no storage capacity to the Ripogenus Project.

[7] An ogee-shaped spillway contains a controlled weir and is S-shaped in profile.

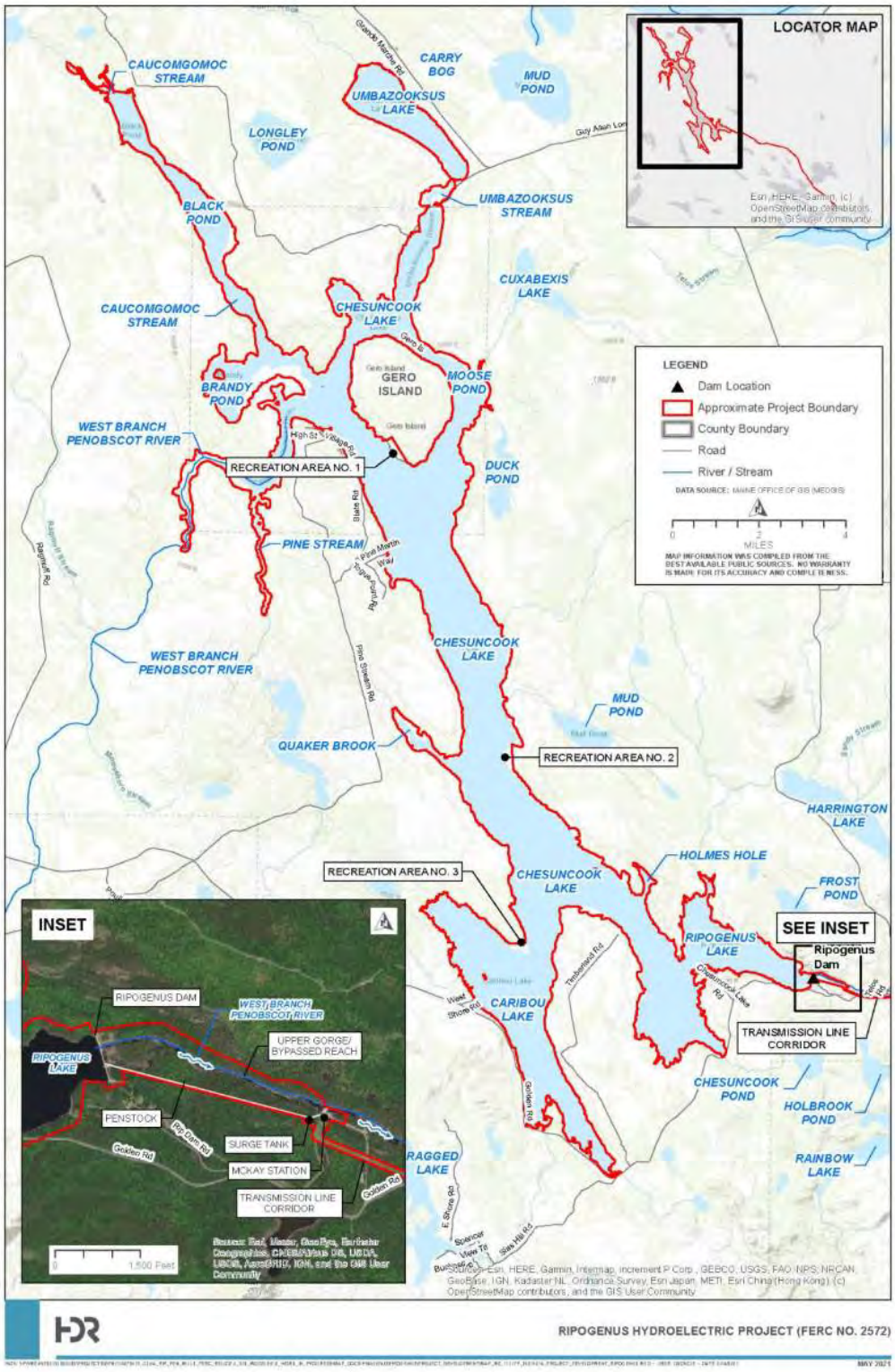



Figure 2. Ripogenus Hydroelectric Project facilities (source: PAD).

*PENOBSCOT MILLS PROJECT*

The Penobscot Mills Project consists of four hydropower developments (North Twin, Millinocket, Dolby, and East Millinocket; located between RM 15 and RM 2 on the West Branch of the Penobscot River) and one storage development (Millinocket Lake Storage Development; located on Millinocket Stream) (figure 3).[8] The primary features of the Penobscot Mills Project include five dams, five impoundments, and four powerhouses. The total installed capacity of the project is 67.9 MW.

The North Twin Impoundment is at the upstream end of the Penobscot Mills Project and receives flow from the Ripogenus Project (figure 3). Releases from the North Twin Development pass through three other developments and associated generation facilities of the Penobscot Mills Project, including the Millinocket, Dolby, and East Millinocket Developments. The Millinocket Lake Storage Development includes a pumping station through which water can be pumped to Ambajejus Lake (within the North Twin impoundment). Otherwise, water is discharged to Millinocket Stream, which enters the West Branch at Shad Pond (downstream from the Millinocket Development; *see* figure 6 below) and passes through the Dolby and East Millinocket Developments.

[8] *See* n. 4 *supra*.

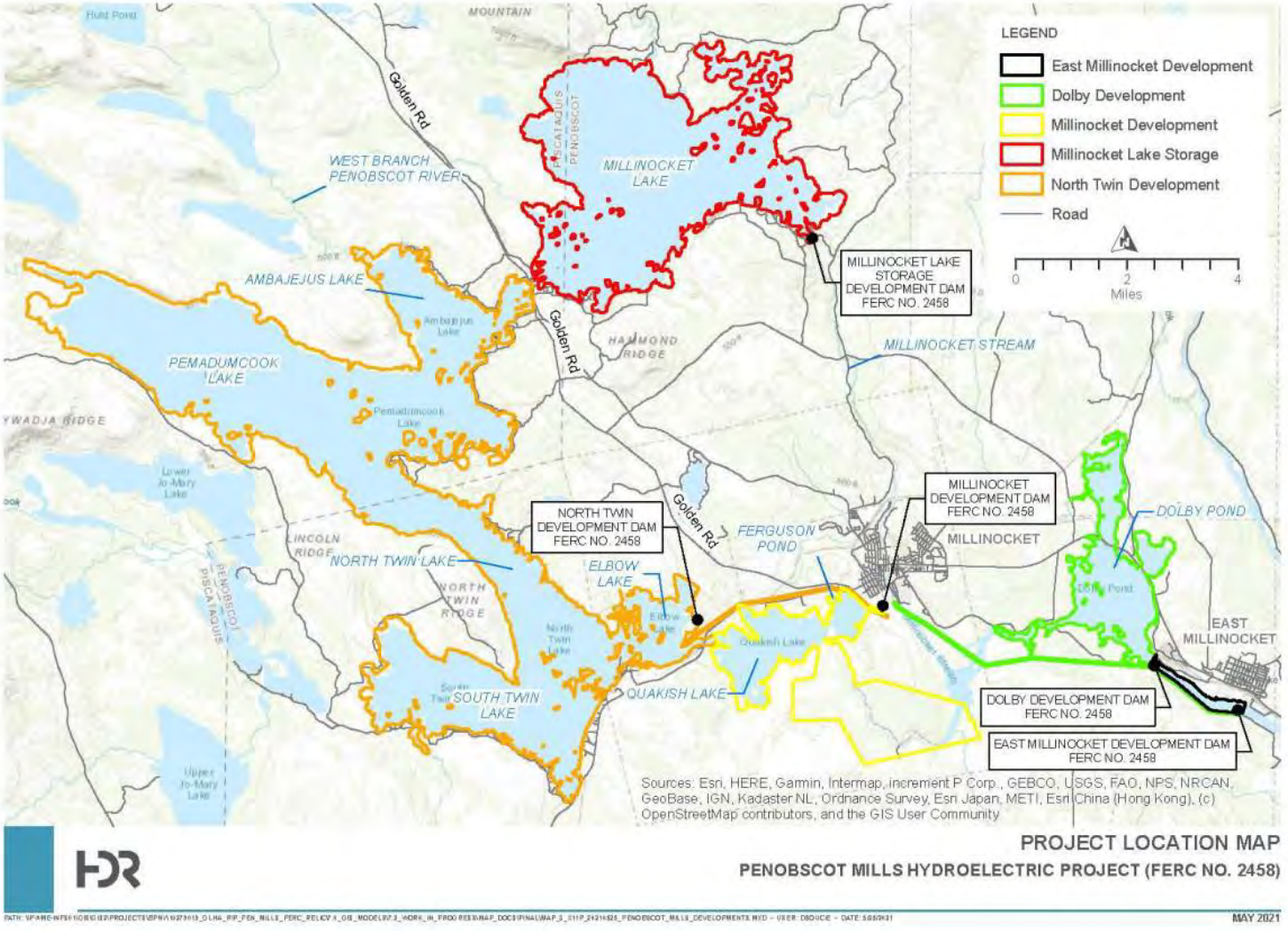



Figure 3. Penobscot Mills Hydroelectric Project Location Map (source: PAD).

**Millinocket Lake Storage Development (figure 4)** – Millinocket Lake has a normal full pond elevation of 480.0 feet, with a surface area of 8,640 acres. The lake has a mean depth of 23.6 feet. Usable storage of the lake is 45,370 acre-feet, with a 6.2-foot drawdown. Millinocket Lake is impounded by a 635-foot-long, concrete and earth-filled dam located on Millinocket Stream, at the outlet of Millinocket Lake. Millinocket Lake Storage Dam includes a 19-foot-long spillway section and an adjacent 58-foot-long gated section that contains four lift gates and one log sluice gate. The dam is located approximately 7.8 miles upstream of the Millinocket Development tailrace. The development's pumping station, which contains two pumps, is located on the west side of Millinocket Lake, about 6.2 miles from Millinocket Lake Storage Dam. Water is conveyed from the pumping station through two 544-foot-long, 4-foot, 6-inch-diameter steel pipes, which is then discharged to Ambajejus Lake through an outlet structure.

**North Twin Development (figure 5)** – The North Twin impoundment includes Elbow, South Twin, North Twin, Pemadumcook, and Ambajejus Lakes. The impoundment is about 11.8 miles long and has a surface area of approximately 17,790 acres at the normal full pond elevation of 491.92 feet. The impoundment's mean depth is 27.7 feet, and its usable storage is about 344,355 acre-feet with a drawdown of 22 feet. The North Twin impoundment is formed by North Twin Dam, which is a 1,051-foot-long concrete and earth-filled structure located at the outlet of Elbow Lake. The dam, which crosses the West Branch from southeast-northwest, includes a 500-foot-long, earthen dike; a 114-foot-wide intake structure and powerhouse; a 34-foot-wide fishway[9] section with two gated log sluices; a 117-foot-long Tainter gate section; and a 286-foot-long earthen embankment. In addition to the dam, there are six dikes, totaling 2,530 feet in length, retaining water.

Water flows from the North Twin impoundment through an intake structure to the powerhouse. The intake contains nine water passages, each 8 feet wide by 13 feet high and equipped with a steel gate to control the flow of water to the turbines. The intake is protected by trash racks with 2-5/8-inch clear bar spacing. The trash racks are cleaned with a trash rake. The 50-foot by 114-foot powerhouse, which is integral with, and located immediately downstream from the intake, contains two vertical fix-blade turbines and one vertical Kaplan turbine, each connected to a generator. The rated capacity of the three turbines is 7.0125 MW and the rated capacity of the three generators is 9.84 MW. Water exits the powerhouse through six tailrace bays and flows through a 104-foot-wide tailrace back to the West Branch.

[9] Flow to the 98-foot-long pool and weir fishway is controlled by three gates located at different depths upstream of the fishway. The upstream fishway provides passage for resident fish species (e.g., landlocked salmon).

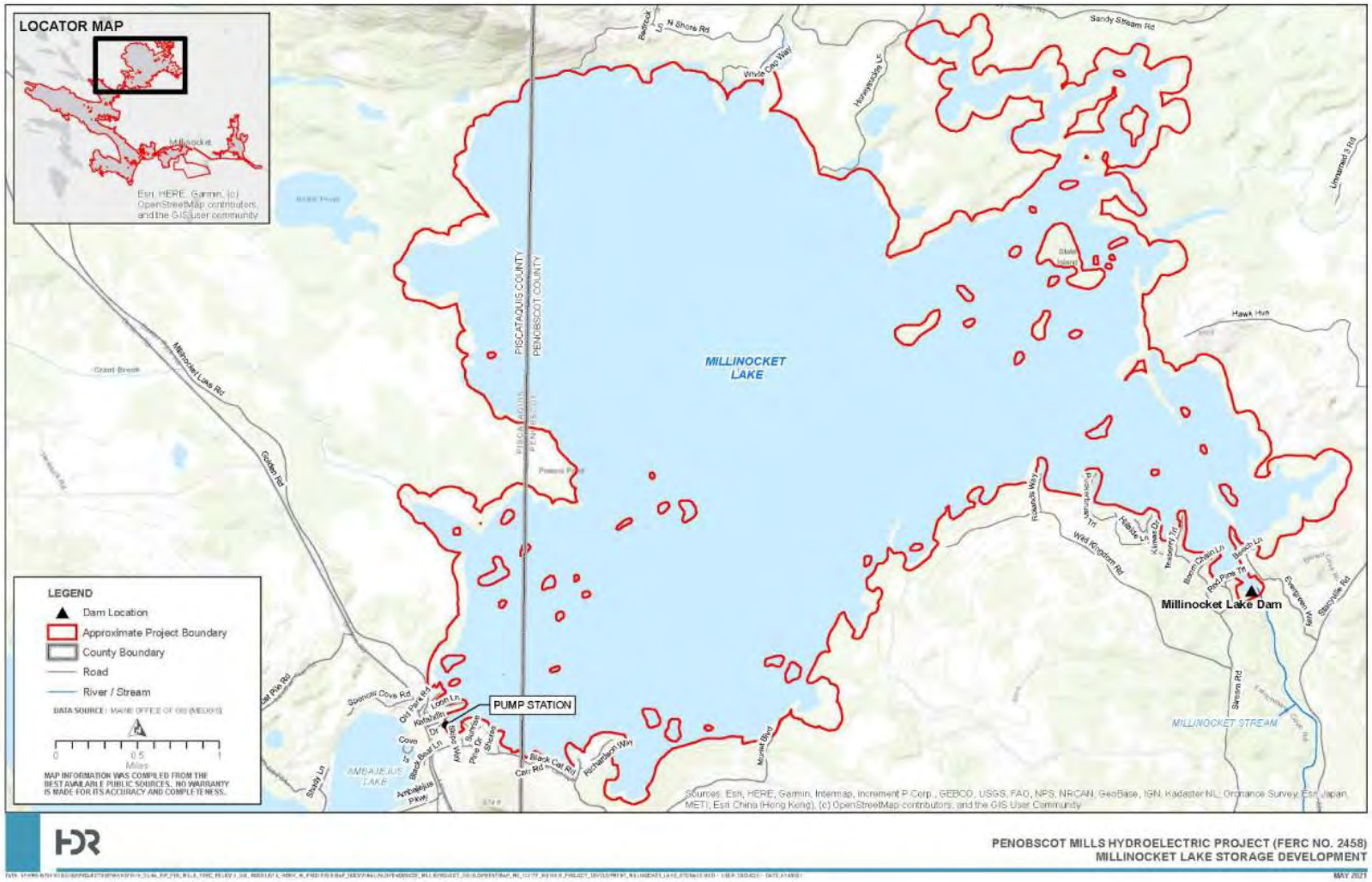



Figure 4. Millinocket Lake Storage Development facilities (source: PAD).

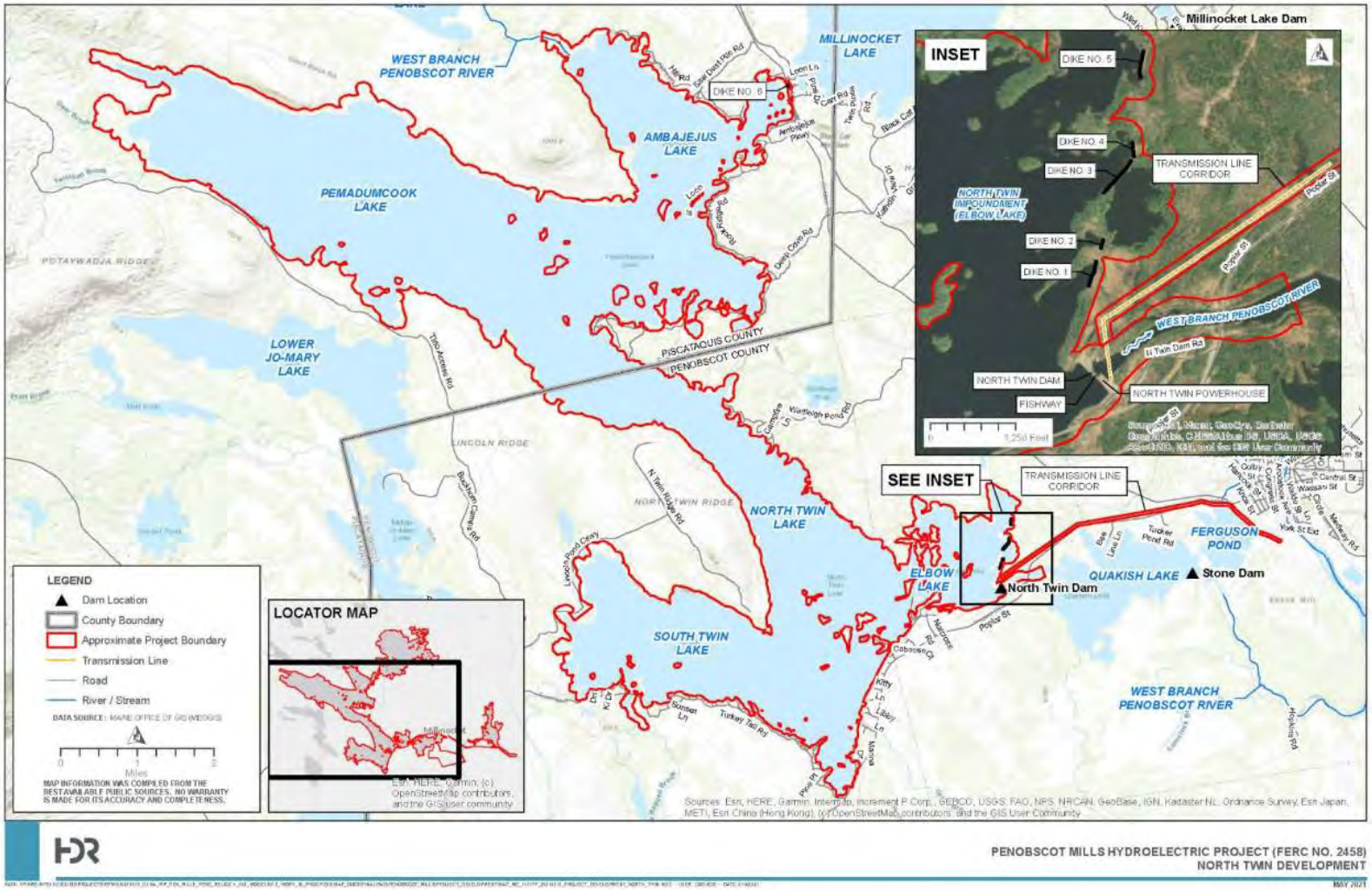



Figure 5. North Twin Development facilities (source: PAD).

The power generated by the North Twin Development is transmitted to the grid via an adjacent substation that contains six transformers and a 4.2-mile-long transmission line that extends to GLHA's Substation #4 located at the former Millinocket Mill.

**Millinocket Development (figure 6)** – The impoundment for the Millinocket Development consists of Quakish Lake and Ferguson Pond. The 8,600-foot-long Quakish Lake has a surface area of 1,344 acres at a normal full pond elevation of 458.7 feet. Quakish Lake and Ferguson Pond provide negligible storage. Stone Dam, a 1,262-foot-long, concrete structure, is located at the outlet of Quakish Lake. The dam directs water into the western canal, and consists of: (1) a 300-foot-long overflow spillway section with no flashboards; (2) a 358-foot-long spillway section with 30-inch-high flashboards; (3) a 52-foot-wide waste gate; (4) a 428-feet, 5-inch-long spillway with a 2-foot, 9-inch-high rubber, inflatable dam; and (5) a 124-foot-long gatehouse. In addition to Stone Dam, there are three dikes, with a total length of 1,854 feet, located along the north shore of Quakish Lake that retain water.

The gatehouse is integral with Stone Dam and is used to regulate flow into the 150-foot-wide by 1,400-foot-long western canal. The western canal conveys water from Quakish Lake to Ferguson Pond. Five earthen dikes, with a total length of 3,915 feet, are located along the perimeter of Ferguson Pond and are used to confine the area impounded by Ferguson Pond. From Ferguson Pond, water enters the 150-foot-wide by 1,300-foot-long eastern canal which conveys water from Ferguson Pond to an intake structure.

The intake structure contains seven gates. Six gates control flow into six 1,007-foot-long, 10-foot-diameter penstocks that lead to turbine-generator units in the 'Grinder Room.' The remaining gate controls flow into a 1024-foot-long, 11-foot-diameter penstock that leads to turbine-generator units in the 'Generator Room.' The 10-foot-diameter penstocks are protected by trash racks with 2-7/8-inch clear bar spacing, and the 11-foot-diameter penstock is protected by trash racks with 2-1/2-inch clear bar spacing. The 174.5-foot-wide by 210-foot-long Grinder Room contains five horizontal Francis turbine-generator units (Units 1, 3, 4, 5, and 6)[10] and the 52-foot-wide by 122-foot-long Generator Room contains two horizontal Francis turbine-generator units (Units 7 and 8). The rated capacity of the seven turbines is 37.3748 MW, and the rated capacity of the seven generators is 38.64 MW. Water exits the turbines through seven, 25-foot-wide tailrace bays that discharge directly to the West Branch.

[10] The Grinder Room also contains an inoperable turbine-generator unit (Unit 2), which does not contribute to the development's rated capacity.

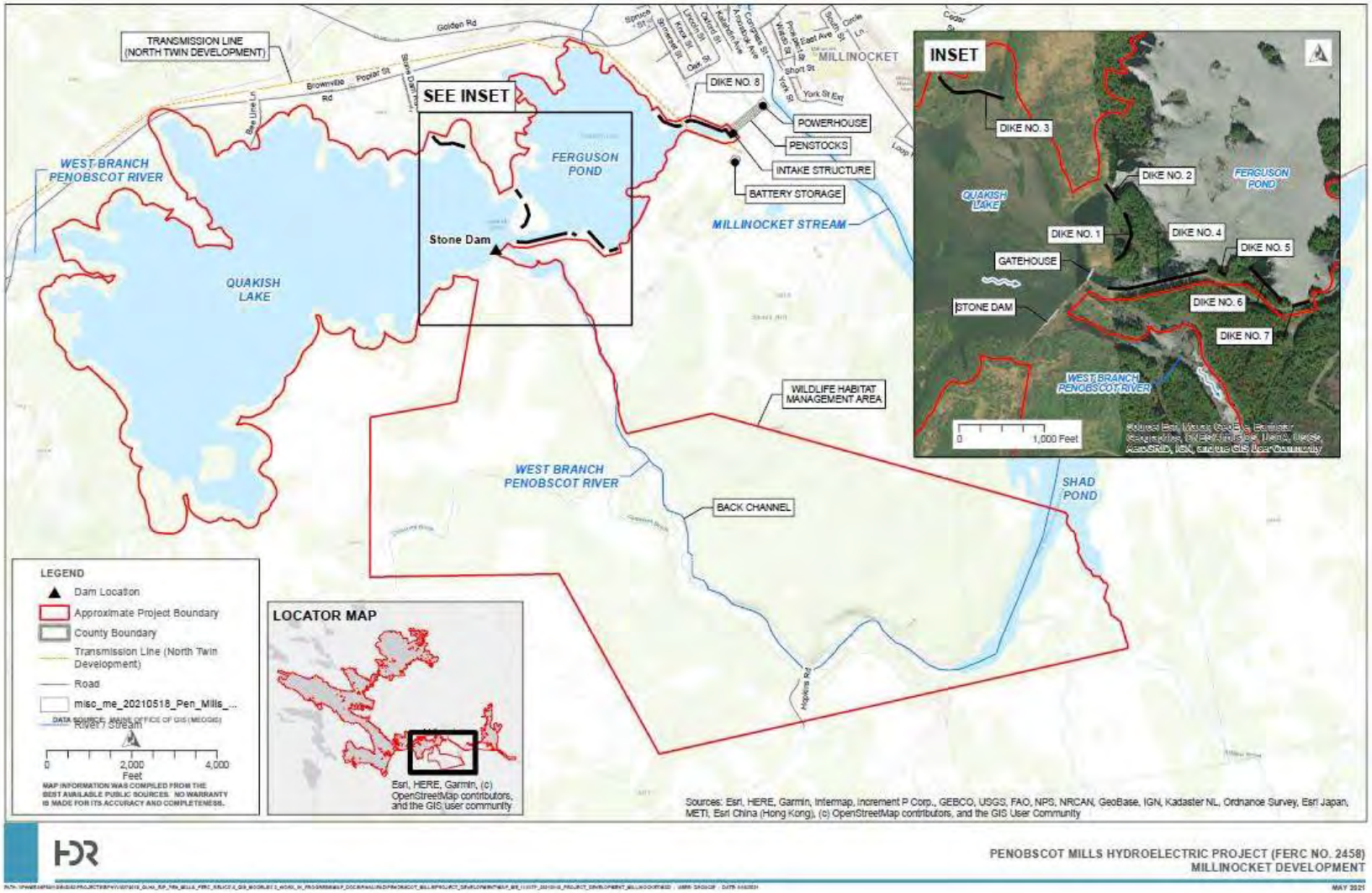



Figure 6. Millinocket Development facilities (source: PAD).

Power generated from Units 3, 4, 5, 6, and 7 is transmitted across Millinocket Stream via a 300-foot-long transmission line to a transformer in GLHA's Substation #1. Power generated from Units 1 and 8 is also transmitted across Millinocket Stream via a 300-foot-long transmission line to a second transformer in Substation #1.

**Dolby Development (figure 7)** – The 4.2-mile-long Dolby Pond has a surface area of 2,048 acres at a normal full pond elevation of 336.2 feet. Dolby Pond provides negligible storage. The 1,395-foot-long Dolby Dam is a concrete and earth-filled structure located at the outlet of Dolby Pond. The dam, which crosses the West Branch in a generally southwest-northwest direction, includes a 27-foot-long concrete abutment; four spillway sections with a total length of 521 feet; two 6-foot-long abutments; a 76-foot-wide waste gate; a 209-foot-wide intake with an integral powerhouse; and two contiguous earthen dikes, measuring 300 feet long and 250 feet long.

Water is withdrawn from Dolby Pond through a 23-foot-wide by 209-foot-long concrete intake structure with nine openings. Each opening is equipped with a headgate to control the flow of water to the turbines. Eight sets of trash racks, having a total length of 174 feet, extend across the upstream side of the intake. The trash racks for bays 2 through 4 have a clear bar spacing of 1-5/8 inches, and the trash racks for bays 5 through 8 have a clear bar spacing of 2-5/8 inches. The gate operators and trash rakes for bays 5 through 8 are housed in a 23-foot-wide by 121-foot-long concrete block building. Water flows from the intake to a 115-foot-wide by 167-foot-long powerhouse that houses four operable turbine-generator units (Units 5, 6, 7, and 8).[11] Three of the operable turbines are Inclined Kaplan units and one is a Fixed Blade unit, each connected to generators. The rated capacity of the four turbines is 17.049 MW, and the rated capacity of the four generators is 17.098 MW. Water exits the turbines through four tailrace bays and flows into a 189-foot-wide tailrace.

The power generated by the Dolby Development is transmitted to the grid via an adjacent substation that contains two transformers and a 2-mile-long transmission line that extends to GLHA's Substation #5.

[11] Units 1, 2, 3, and 4 in the Dolby Powerhouse are currently out-of-service, and do not contribute to the development's rated capacity.

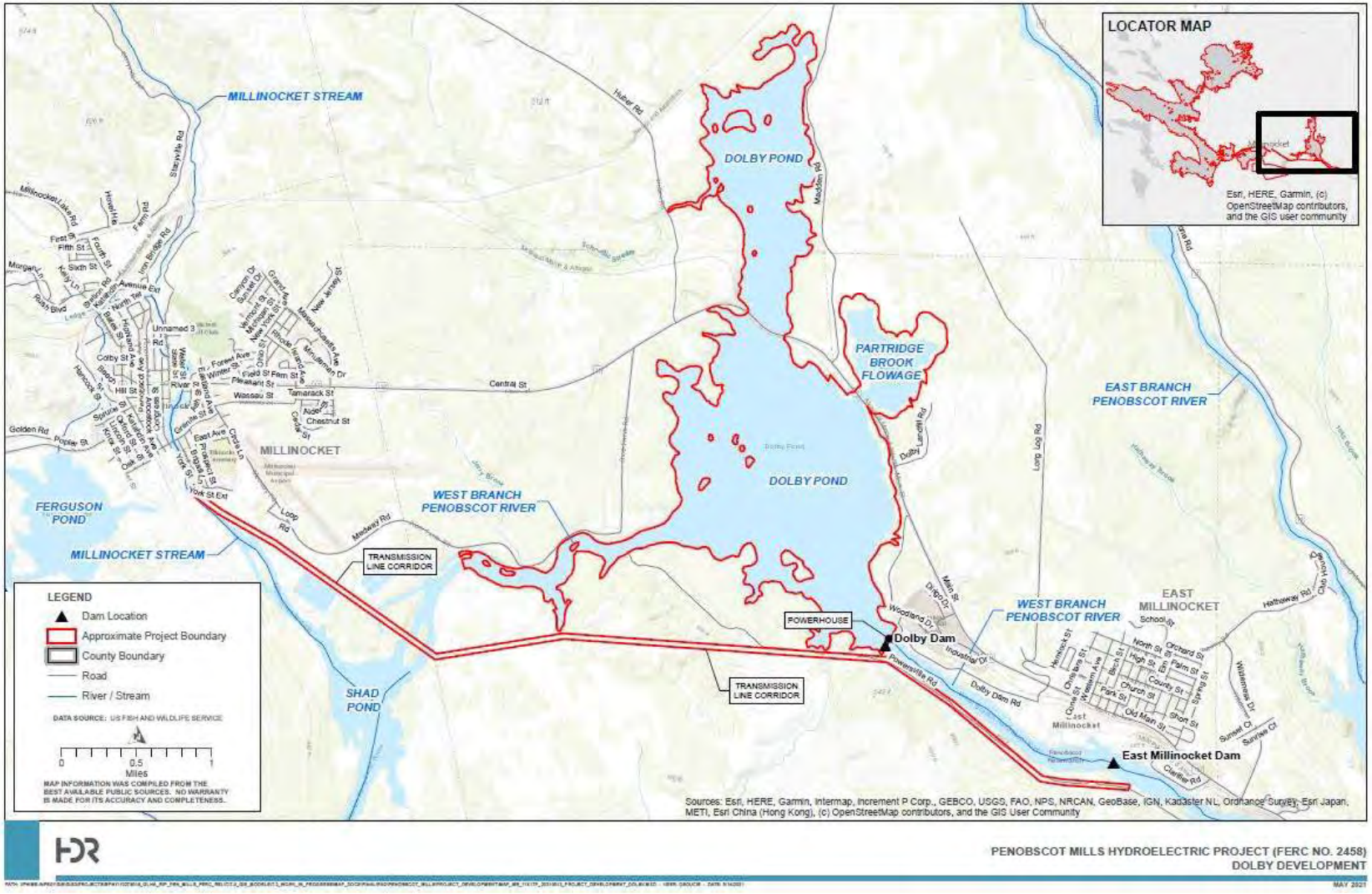



Figure 7. Dolby Development facilities (source: PAD).

**East Millinocket Development (figure 8)** – The East Millinocket Development is located at the former East Millinocket Mill, about 1.7 miles upstream of Black Bear Hydro Partners, LLC's Medway Hydroelectric Project No. 2666. The 1.9-mile-long East Millinocket impoundment extends upstream to the tailwater of the Dolby Development. The impoundment has a surface area of 128 acres at a normal full pond elevation of 287.2 feet and has negligible storage. The 717.5-foot-long East Millinocket Dam, which crosses the West Branch in a generally east-west direction, consists of a 116-foot-long earth embankment; a 212-foot-long spillway section; a 59-foot-wide waste gate; a 154-foot-long spillway section; a 7-foot-wide timber crib section; a 23-foot-wide sluice gate; and a 146.5-foot-wide intake structure integral with the powerhouse.

Water from the East Millinocket impoundment flows through a 146.5-foot-long by 54-foot-wide intake structure, containing 12, 9-foot by 11-foot gate openings. Each of 12 gate openings are equipped with a steel headgate connected to a hand-operated gate hoist that controls the flow of water into the intake. The intake is protected by trash racks that have a 1-1/4-inch clear bar spacing. From the intake, water flows into to six covered flumes in a 56-foot-wide by 146.5-foot-wide powerhouse. Each flume contains a horizontal Francis turbine connected to a generator. The rated capacity of the six turbines is 6.975 MW and the rated capacity of the six generators is 9.952 MW. Water exits the powerhouse and flows through a 1,050-foot-long tailrace (average width of 110 feet) to the West Branch.

The power generated by the East Millinocket Development is transmitted to the grid via two 6,900-volt buses, which are connected to a transformer that is part of Substation #3 located at the former East Millinocket Mill. From the transformer, power is transmitted to Substation #5 via a 2-mile-long transmission line.

**Battery Energy Storage System** – The Projects include two utility-scale battery energy storage sites that operate as a single Battery Energy Storage System. One of the battery storage sites is located at the Powersville Substation (within the transmission right-of-way for the Dolby and East Millinocket Developments). This battery storage site is sized at a capacity of 10 MW with a 2-hour duration (20 MWh total capacity). The second battery storage site is located within the Ripogenus Project's 115-kV (200-foot-wide) transmission line right-of-way adjacent to the Millinocket Substation #4 (partially within the Penobscot Mills Project boundary and partially within the Ripogenus Project boundary). This battery storage site is also sized at a capacity of 10 MW with a 2-hour duration (20 megawatt hours [MWh] total capacity). The Battery Energy Storage System has a total capacity of 20 MW for up to 2 hours (40 MWh total capacity).

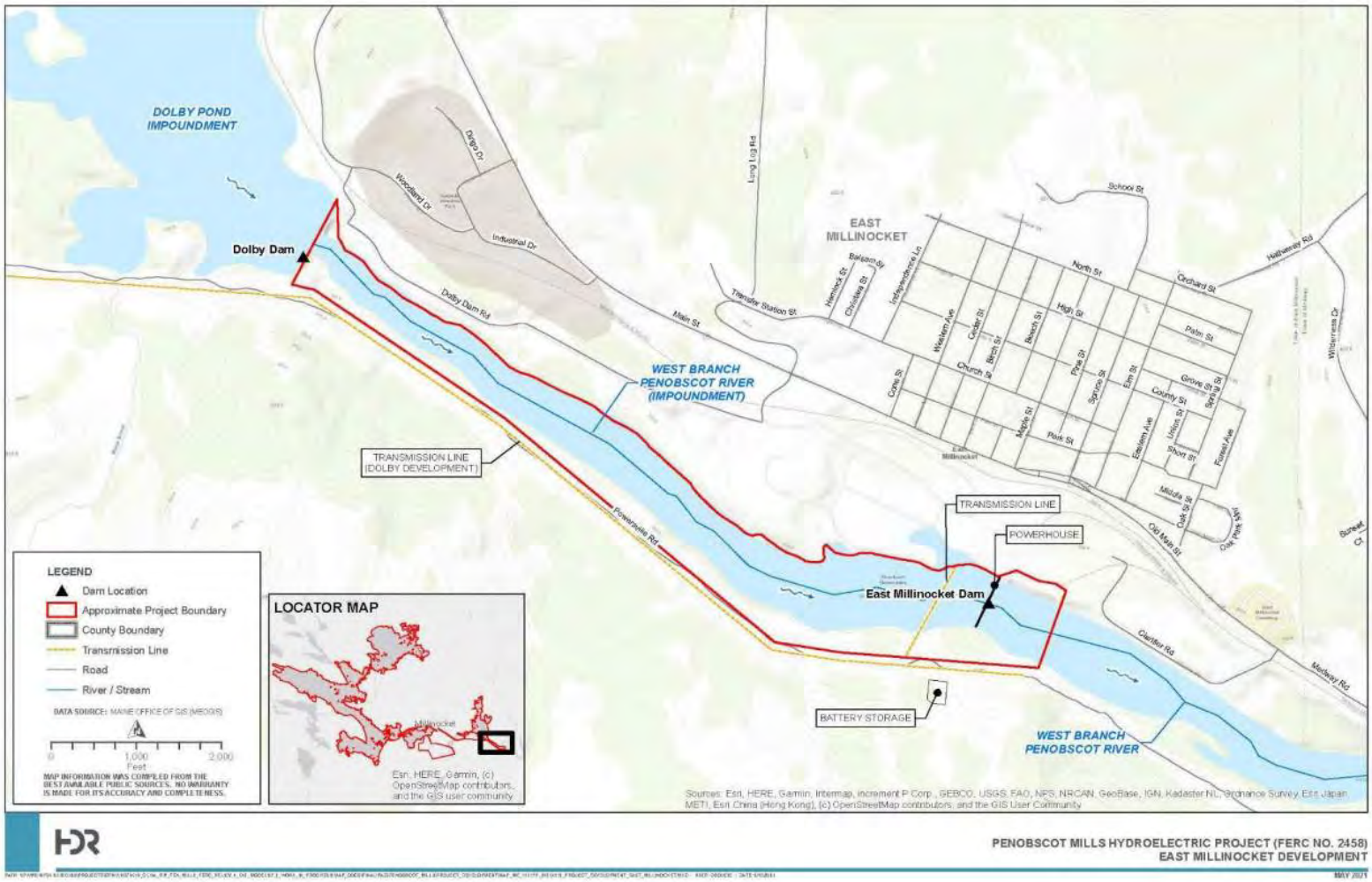



Figure 8. East Millinocket Development facilities (source: PAD).

### 3.1.2 Recreation Facilities

*RIPOGENUS PROJECT*

Ripogenus Project recreation facilities consist of a boat launch (Chesuncook Point Boat Launch), a boat put-in (Caribou Lake Put-In), 12 campsites (Chesuncook Lake Remote Campsites-10; Umbazooksus Stream Campsites-2), rafting put-in facilities (McKay Station Rafting Put-In Site), and a 0.75-mile-long trail (Upper Gorge Trail).

*PENOBSCOT MILLS PROJECT*

Penobscot Mills Project recreation facilities consist of six boat launches. The Millinockett Lake Public Boat Launch is located at the Millinocket Lake Storage Development. The Ambajejus Lake Boat Launch and South Twin Lake (Partridge Cove) Boat Launch are located at the North Twin Development. The Green Bridge Boat Launch is located at the Millinocket Development. The Dead Man's Curve Boat Launch and Dolby Pond (Flowage) Boat Launch are located at the Dolby Development.

### 3.1.3 Project Operation

*RIPOGENUS PROJECT*

The Ripogenus Project operates as a store-and-release facility with an annual seasonal drawdown that allows for management of water levels and flows downstream of the project. The normal full pond elevation of the Ripogenus impoundment is 941.6 feet, with a maximum drawdown of 44 feet (based on operational limitations of the project). During normal operation and normal inflow years, the Ripogenus impoundment elevation is held relatively stable at 941.6 feet during the summer months and is gradually drawn down starting in the fall, with a target low elevation of 913.6 feet by late winter, in anticipation of spring thaw and high flows. This operation results in a target seasonal drawdown of 28 feet. In the spring, the Ripogenus impoundment elevation rises based on inflows from the upstream Storage Project No. 2634, spring thaw, and precipitation, with the goal of reaching 941.6 feet by late spring. In coordination with the upstream Storage Project and the downstream Penobscot Mills Project, Ripogenus Project operators balance downstream flows and water levels to support flood control, public safety, dam safety, supplemental flows during seasonal low-flow periods, fish spawning and migration, recreation and whitewater boating, water quality, and generation needs.

GLHA also provides a minimum flow of 100 cubic feet per second (cfs) through sluice gates into the bypassed reach (Upper Gorge) from July 1 through September 30 and 12 cfs through leakage from Ripogenus Dam from October 1 through June 30. In

addition, the project provides seasonally variable minimum flows downstream of McKay Station into the West Branch, according to the schedule in table 1, to facilitate drawdown of the North Twin impoundment, protect landlocked salmon spawning, and provide whitewater recreation flows. During failure of the generating units, the project releases 400 cfs.

Table 1. Minimum flows released from McKay Station into the West Branch. (Source: PAD).

| Date range | Minimum flow released |
|---|---|
| **Facilitate North Twin impoundment drawdown** | |
| September 16 through October 14 | 1,000 cfs |
| **Landlocked salmon flows** | |
| October 15 through November 15 | At least 1,422 cfs, or inflow, but not less than 1,300 cfs at any time.[a] |
| November 16 through June 7 | Greater than 1,422 cfs.[a] |
| **Whitewater recreation flows** | |
| May 1 through September 15 (8:30 AM - 5:00 PM) | **Normal hydrologic year:**<br>2,300 cfs on Saturdays and Sundays<br>2,200 cfs on Mondays and Fridays<br>2,000 cfs on Tuesdays through Thursdays<br>**Wet or dry hydrologic year:**<br>2,200 cfs on Saturdays and Sundays<br>2,000 cfs on Mondays and Fridays<br>1,800 cfs on Tuesdays through Thursdays |
| September 16 to October 1 (8:30 AM - 5:00 PM) | **Normal hydrologic year:**<br>2,300 cfs on Saturdays and Sundays<br>**Wet or dry hydrologic year:**<br>2,200 cfs on Saturdays and Sundays |
| June 8 to October 14 (5:00 PM - 8:30 AM) | 1,000 cfs |

[a] Actual flows are established each year in consultation with the U.S. Fish and Wildlife Service and Maine Department of Inland Fisheries and Wildlife.

GLHA also uses the Ripogenus Project to provide flows that are diverted to the Holbrook Side Channel from the West Branch.[12] Two pipes are used for this purpose. One is equipped with a valve that can be opened or closed to increase or reduce flows from the West Branch into the channel; the other has no valve to control flow. Flows from the channel re-enter the West Branch about 1,000 feet downstream from the pipes. Flows into the channel range from about 35 cfs to 65 cfs during normal operating conditions, depending on the amount of flow in the West Branch. On about June 1, GLHA closes the valve to reduce flow into the channel to enhance conditions for landlocked salmon and brook trout fry emergence and production. On about October 15, GLHA opens the valve to increase flow into the channel to enhance conditions for landlocked salmon and brook trout spawning.

*PENOBSCOT MILLS PROJECT*

The five developments that compose the Penobscot Mills Project are operated as an integrated system, primarily making use of flows received from the Ripogenus Project. The two store-and-release developments (Millinocket Lake Storage and North Twin) are located upstream of the run-of-river developments (Millinocket, Dolby, and East Millinocket). The North Twin impoundment receives flow from the Ripogenus Project. Flow from the Millinocket Lake Storage Development is either pumped into Ambajejus Lake (part of the North Twin impoundment) or flows down Millinocket Stream and enters the West Branch downstream from the Millinocket Development.

**Millinocket Lake Storage Development** – GLHA operates the Millinocket Lake Storage Development solely as a storage development, with no hydropower facilities. The development is operated as part of the larger West Branch system to manage flows and water levels within the West Branch and downstream in the Mainstem Penobscot River. GLHA maintains the water level in Millinocket Lake between elevations 470.0 feet and 480.0 feet (normal full pond elevation) by either pumping water via the development's pumping station to the North Twin impoundment (typically to maintain required impoundment levels within the North twin impoundment), or by releasing water into Millinocket Stream. In addition, GLHA releases a minimum flow of 60 cfs from Millinocket Lake into Millinocket Stream from May 1 through October 15, and a minimum flow of 60 cfs or inflow, whichever is less, from October 16 through April 30.

**North Twin Development** – Consistent with the operation of the Millinocket Lake Storage Development and the Ripogenus Project, the North Twin Development is

[12] The Holbrook Side Channel is a 1,400-foot-long channel located adjacent to the West Branch approximately 1.7 RM downstream from Ripogenus Dam.

operated to support flow management and water levels in the West Branch and the mainstem Penobscot River. The North Twin Development operates as a store-and-release facility, with a normal full pond elevation of 491.92 feet. Pursuant to the current license, GLHA maintains the North Twin impoundment above elevation 488.42 feet (within 3.5 feet from normal full pond). From October 15 to the start of the spring freshet season, the impoundment elevation is gradually drawn down to an elevation of 479.42 feet (12 feet below normal full pond). However, during periods of high inflows, GLHA may use more than 12 feet of storage in the North Twin impoundment. From ice out to August 22, the impoundment is refilled and is maintained within plus or minus 0.5 foot of a target elevation of 490.42 feet (or within 1.5 feet from normal full pond elevation).

In addition to maintaining impoundment levels, GLHA releases a minimum flow of 3,000 cfs from the North Twin Development from August 22 through October 15, provided the impoundment elevation exceeds 488.42 feet. If the 488.42-foot elevation is not met, GLHA releases a minimum flow of 2,000 cfs from the North Twin Development to meet the 2,000-cfs minimum flow requirement at Shad Pond (located downstream from the Millinocket and Millinocket Lake Storage Developments).

The North Twin Development is equipped with a pool-and-weir fishway. GLHA maintains a stable impoundment elevation from May 1 through August 22 for recreation purposes, which also provides a suitable impoundment elevation for the fishway exit. In addition, GLHA provides an attraction flow of 3.5 cfs through an 8-inch-diamater gravity pipe that extends from the dam to the fishway entrance.

**Millinocket, Dolby, and East Millinocket Developments** – GLHA operates the Millinocket, Dolby, and East Millinocket Developments in a run-of-river mode, with typical impoundment fluctuations of 1 foot or less from the top of the flashboards when installed or crest of dam without flashboards. In addition, GLHA releases a minimum flow of 2,000 cfs through each development to the West Branch, as measured downstream from Shad Pond. Run-of-river operation and the minimum flows are accomplished through use of the developments' turbines. If use of the turbines is not possible, GLHA uses the inflatable, rubber dam at Stone Dam at the Millinocket Development and waste gates at the Dolby and East Millinocket Development to support run-of-river operations.

**Battery Energy Storage System** – In 2020, GLHA installed a utility-scale Battery Energy Storage System at the Projects. One battery storage site is located at the Millinocket Substation #4 and the other is located the Powersville Substation. The Battery Energy Storage System is connected to the Project's transmission lines and collects power from the Projects at 34.5 kV and delivers it to the grid at 115 kV. The two

battery storage sites can be isolated from the substations using breakers and switches, if necessary. The system only charges from the hydroelectric facilities, and not from the grid. The system has not, and would not, change how the Projects are operated.

### 3.1.4 Proposed Environmental Measures

GLHA proposes to continue to operate and maintain the Ripogenus Project and the Penobscot Mills Project as required by their current licenses. GLHA does not propose any new development or changes in project operation. The environmental measures that are currently proposed by GLHA are described below.

**Aquatic Resources**

- Continue to provide seasonally variable minimum flows from Ripogenus Dam into Upper Gorge and from McKay Station into the West Branch as described above in table 1.

- Continue to provide flows to the Holbrook Side Channel for landlocked salmon and brook trout spawning and rearing as describe above in table 1.

- Continue to provide the seasonal minimum flows described above from Millinocket Lake Storage Dam into Millinocket Stream.

- Continue to provide the minimum flows described above from North Twin Dam, as well as the Millinocket, Dolby, and East Millinocket Developments to the West Branch.

**Wildlife and Botanical Resources**

- Continue to deploy artificial nesting platforms for the Common Loon and other aquatic birds in the Ripogenus impoundment.

- Continue to implement and maintain the wildlife enhancement measures included in the Wildlife management Plan required by Article 412 of the current license for the Wildlife Management Area located adjacent to the Back Channel downstream from Stone Dam.

**Recreation Resources**

- Continue to operate and maintain the 11 recreation sites described above for the Projects.

- Continue to collect recreation use information every 6 years for the project recreation sites.

- Continue to provide whitewater boating flows downstream from McKay Station, as described above in table 1.

- Update the existing Recreation Plans for the Projects as part of the license applications.

**Cultural Resources**

- Develop updated Historic Properties Management Plans for the Projects.

## 3.2 DAM SAFETY

It is important to note that dam safety constraints may exist and should be taken into consideration in the development of proposals and alternatives considered in the pending proceedings. For example, proposed modifications to dam structures could impact the integrity of the dams' structures. As the proposals and alternatives are developed, the applicant must evaluate the effects and ensure that the Projects would meet the Commission's dam safety criteria found in Part 12 of the Commission's regulations and the Engineering Guidelines (http://www.ferc.gov/industries/hydropower/safety/guidelines/eng-guide.asp).

## 3.3 ALTERNATIVES TO THE PROPOSED ACTIONS

Commission staff will consider and assess all alternative recommendations for operational or facility modifications, as well as protection, mitigation, and enhancement measures identified by the Commission, the agencies, Native-American tribes, NGOs, and the public.

## 3.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

At present, we propose to eliminate the following alternatives from detailed study in the NEPA document.

### 3.4.1 Federal Government Takeover

In accordance with § 16.14 of the Commission's regulations, a federal department or agency may file a recommendation that the United States exercise its right to take over a hydroelectric power project with a license that is subject to sections 14 and 15 of the FPA.[13] We do not consider federal takeover to be a reasonable alternative. Federal takeover of the Projects would require congressional approval. While that fact alone would not preclude further consideration of this alternative, there is currently no evidence showing that federal takeover should be recommended to Congress. No party has suggested that federal takeover would be appropriate, and no federal agency has expressed interest in operating the Projects.

### 3.4.2 Non-power License

A non-power license is a temporary license the Commission would terminate whenever it determines that another governmental agency is authorized and willing to assume regulatory authority and supervision over the lands and facilities covered by the non-power license. At this time, no governmental agency has suggested a willingness or ability to take over the Projects. No party has sought a non-power license for either project, and we have no basis for concluding that the Ripogenus and Penobscot Mills Projects should no longer be used to produce power. Thus, we do not consider a non-power license a reasonable alternative to relicensing the projects.

### 3.4.3 Project Decommissioning

As the Commission has previously held, decommissioning is not a reasonable alternative to relicensing in most cases.[14] Decommissioning can be accomplished in different ways depending on the project, its environment, and the particular resource needs.[15] For these reasons, the Commission does not speculate about possible

[13] 16 U.S.C. §§ 791(a)-825(r).

[14] *See, e.g., Eagle Crest Energy Co*., 153 FERC ¶ 61,058, at P 67 (2015); *Public Utility District No. 1 of Pend Oreille County*, 112 FERC ¶ 61,055, at P 82 (2005); *Midwest Hydro, Inc*., 111 FERC ¶ 61,327, at PP 35-38 (2005).

[15] In the unlikely event that the Commission denies relicensing a project or a licensee decides to surrender an existing project, the Commission must approve a surrender "upon such conditions with respect to the disposition of such works as may be determined by the Commission." 18 C.F.R. § 6.2 (2020). This can include simply shutting down the power operations, removing all or parts of the project (including the

decommissioning measures at the time of relicensing, but rather waits until an applicant actually proposes to decommission a project, or a participant in a relicensing proceeding demonstrates that there are serious resource concerns that cannot be addressed with appropriate license measures and that make decommissioning a reasonable alternative.[16] GLHA does not propose decommissioning, nor does the record to date demonstrate there are serious resource concerns that cannot be mitigated if the projects are relicensed; as such, there is no reason, at this time, to include decommissioning as a reasonable alternative to be evaluated and studied as part of staff's NEPA analysis.

# 4.0 SITE-SPECIFIC RESOURCE ISSUES

## 4.1 RESOURCE ISSUES

In this section, we present a preliminary list of environmental issues to be addressed in the NEPA document. We identified these issues, which are listed by resource area, by reviewing the PAD and the Commission's record for the Ripogenus Project and Penobscot Mills Project. The environmental issues identified apply to both projects, unless otherwise specified in the issue description. This list is not intended to be exhaustive or final, but contains those issues raised to date that could have substantial effects. After the scoping process is complete, we will review the list and determine the appropriate level of analysis needed to address each issue in the NEPA document.

### 4.1.1 Geologic and Soils Resources

- Effects of continuing to operate the Projects on shoreline erosion in the impoundments.

### 4.1.2 Water and Aquatic Resources

- Effects of continuing to operate the Projects (e.g., seasonal store-and-release operation of the Ripogenus Project and the Penobscot Mills Project's Millinocket Lake Storage and North Twin Developments) on

dam), or restoring the site to its pre-project condition.

[16] *See* generally *Project Decommissioning at Relicensing*; Policy Statement, FERC Stats. & Regs., Regulations Preambles (1991-1996), ¶ 31,011 (1994); *see also City of Tacoma, Washington,* 110 FERC ¶ 61,140 (2005) (finding that unless and until the Commission has a specific decommissioning proposal, any further environmental analysis of the effects of project decommissioning would be both premature and speculative).

water quantity and flow in the West Branch, including effects on impoundment water levels and flooding downstream.

- Effects of continuing to operate the Projects on DO concentrations and water temperature in the project impoundments and project-affected reaches downstream from project dams and powerhouses (e.g., Upper Gorge, Holbrook Side Channel, Back Channel, Millinocket Stream, and reaches of the West Branch).

- Effects of the drawdowns of the Ripogenus, North Twin, and Millinocket Lake impoundments on access to impoundment tributaries for resident fish (e.g., landlocked salmon and rainbow smelt).

- Effects of continuing to operate the Projects on aquatic habitat for resident fish and freshwater mussel species in the project impoundments and project-affected reaches downstream from project dams and powerhouses (e.g., Upper Gorge, Holbrook Side Channel, Back Channel, Millinocket Stream, and reaches of the West Branch).

- Effects of continuing to operate the Projects on upstream and downstream passage of American eels in the West Branch.

- Effects of continuing to operate the Projects on the movement of sea-run Atlantic salmon and alosines (American shad and river herring) in the West Branch and mainstem Penobscot River.

- Effects of continuing to operate the Projects on essential fish habitat for Atlantic salmon.

- Effects of continuing to operate the Projects on fish impingement, entrainment, and survival at the Projects' developments.

- Effects of continuing to operate the Projects on state-protected aquatic species (e.g., brook floater, yellow lampmussel, and tidewater mucket).

### 4.1.3 Wildlife and Botanical Resources

- Effects of continuing to operate the Projects on wetlands, as well as littoral and riparian habitat in, and along, the project impoundments.

- Effects of continuing to operate the Projects on state-protected wildlife and plant species (e.g., little brown bat, eastern small-footed bat, and wood turtle).

### 4.1.4 Threatened and Endangered Species

- Effects of continuing to operate and maintain the Projects on the federally threatened Canada lynx and its designated habitat, northern long-eared bat, and the federally endangered Gulf of Maine Distinct Population Segment Atlantic salmon and its designated critical habitat.[17]

### 4.1.5 Recreation and Land Use

- Effects of continuing to operate and maintain the Projects on the project recreation facilities and their use, as well as recreational opportunities on the West Branch.

- Adequacy of existing project recreational facilities to meet existing and future recreational demand and capacity requirements.

- Adequacy of existing whitewater flows and access on the West Branch downstream from McKay Station.

### 4.1.6 Cultural Resources

- Effects of continuing to operate and maintain the Projects on properties that are included in, or eligible for inclusion in, the National Register of Historic Places.

### 4.1.7 Developmental Resources

- Effects of proposed or recommended environmental measures on the Projects' generation and economics.

[17] This list is derived from our July 28, 2021 search of the U.S. Fish and Wildlife Service's ECOS-IPaC website.

## 5.0 PROPOSED STUDIES

GLHA's initial study proposals are identified by resource area for the Ripogenus Project (table 2) and the Penobscot Mills Project (table 3). Detailed information on GLHA's initial study proposals can be found in Section 6.2, *Proposed Studies and Information Gathering Associated with Identified Issues*, of the PAD. Further studies may need to be added to this list based on comments provided to the Commission and GLHA from interested participants, including Native-American tribes.

**Table 2**. GLHA's initial study proposals for the Ripogenus Project. (Source: PAD).

| Resource area | Proposed Study |
|---|---|
| **Aquatic Resources** | |
| *Water Quality* | Collect water quality data in project impoundment, Upper Gorge, and downstream of McKay Station to inform FERC relicensing and the water quality certification process. |
| *Macroinvertebrate Community* | Conduct a survey to characterize the macroinvertebrate community downstream from McKay Station. |
| **Recreation, Land Use, and Aesthetics** | |
| *Recreation Facilities* | Characterize the existing recreation facilities in the project boundary, including their condition. |

**Table 3**. GLHA's initial study proposals for the Penobscot Mills Project. (Source: PAD).

| Resource area | Proposed Study |
|---|---|
| **Aquatic Resources** | |
| *Water Quality* | Collect water quality data in the impoundments and riverine/tailwater areas of each development to inform FERC relicensing and the water quality certification process. |

| Resource area | Proposed Study |
|---|---|
| *Macroinvertebrate Community* | Conduct a survey to characterize the macroinvertebrate community in each of the tailwater and riverine reaches. |
| *Aquatic Habitat* | Map and characterize aquatic and riparian mesohabitat types in the Millinocket Development's Back Channel under the existing flow regime. |
| **Recreation, Land Use, and Aesthetics** | |
| *Recreation Facilities* | Characterize the existing recreation facilities in the project boundary, including their condition. |

## 6.0 REQUEST FOR INFORMATION AND STUDIES

We are asking federal, state, and local resource agencies, Native-American tribes, NGOs, and the public to forward to the Commission any information that will assist us in conducting an accurate and thorough analysis of the project-specific effects associated with relicensing the Ripogenus Project and the Penobscot Mills Project. The types of information requested include, but are not limited to:

- information, quantitative data, or professional opinions that may help define the scope of the analysis, and that helps identify significant environmental issues;

- identification of, and information from, any other EA, EIS, or similar environmental study (previous, on-going, or planned) relevant to the proposed relicensing of the Ripogenus Project and the Penobscot Mills Project;

- existing information and any data that would help characterize environmental conditions and habitats and in the assessment of project effects on environmental resources;

- the identification of any relevant federal, state, or local resource plans, documentation showing why any resources should be excluded from further study or consideration; and

- study requests by federal and state agencies, local agencies, Native-American tribes, NGOs, and the public that would help provide a framework for collecting pertinent information on the resource areas under consideration necessary for the Commission to prepare the NEPA document for the Projects.

All requests for studies filed with the Commission must meet the criteria found in Appendix A, *Study Plan Criteria*.

The requested information, comments, and study requests should be submitted to the Commission no later than October 9, 2021. All filings must clearly identify the following on the first page: **Ripogenus Hydroelectric Project (P-2572-133)** and/or **Penobscot Mills Hydroelectric Project (P-2458-247)**. Scoping comments may be filed electronically via the Internet. *See* 18 C.F.R. 385.2001(a)(1)(iii) and the instructions on the Commission's website at http://www.ferc.gov/docs-filing/efiling.asp. Commenters can submit brief comments up to 6,000 characters, without prior registration, using the eComment system at http://www.ferc.gov/docs-filing/ecomment.asp. You must include your name and contact information at the end of your comments. For assistance, please contact FERC Online Support at Mailto:FERCOnlineSupport@ferc.gov, or toll free at 1-866-208-3676, or for TTY, (202) 502-8659. In lieu of electronic filing, you may submit a paper copy. Submissions sent via the U.S. Postal Service must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 888 First Street NE, Room 1A, Washington, DC 20426. Submissions sent via any other carrier must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 12225 Wilkins Avenue, Rockville, Maryland 20852.

Register online at http://www.ferc.gov/esubscription.asp to be notified via email of new filings and issuances related to these or other pending projects. For assistance, please contact FERC Online Support at Mailto:FERCOnlineSupport@ferc.gov.

Any questions concerning the scoping meetings or how to file written comments with the Commission should be directed to Allan Creamer at (202) 502-8365, or allan.creamer@ferc.gov. Additional information about the Commission's licensing process, as well as the Ripogenus Project and the Penobscot Mills Project, may be obtained from the Commission's website, www.ferc.gov.

## 7.0 INITIAL PROCESSING SCHEDULE

The decision on whether to prepare and EA or EIS will be determined after the license application is filed and we fully understand the scope of effects and measures under consideration. The NEPA document will be distributed to all persons and entities on the Commission's service and mailing lists for the Ripogenus Project and the

Penobscot Mills Project. The NEPA document will include our recommendations for operating procedures, as well as environmental protection and enhancement measures that should be part of any license issued by the Commission. The comment period will be specified in the notice of availability of the NEPA document.

A copy of GLHA's process plan for developing the license application is attached as Appendix B to this SD1.

## 8.0 COMPREHENSIVE PLANS

Section 10(a)(2) of the FPA, 16 U.S.C. Section 803(a)(2)(A), requires the Commission to consider the extent to which a project is consistent with federal and state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by a project. The staff has preliminarily identified and reviewed the plans listed below that may be relevant to the Projects. Agencies are requested to review this list and inform the Commission staff of any changes. If there are other comprehensive plans that should be considered for this list that are not on file with the Commission, or if there are more recent versions of the plans already listed, they can be filed for consideration with the Commission according to 18 CFR 2.19 of the Commission's regulations. Please follow the instructions for filing a plan at http://www.ferc.gov/industries/hydropower/gen-info/licensing/complan.pdf.

The following is a list of comprehensive plans currently on file with the Commission that may be relevant to the Projects:

Atlantic States Marine Fisheries Commission. 1999. Amendment 1 to the Interstate Fishery Management Plan for shad and river herring. (Report No. 35). April 1999.

Atlantic States Marine Fisheries Commission. 2000. Interstate Fishery Management Plan for American eel (*Anguilla rostrata*). (Report No. 36). April 2000.

Atlantic States Marine Fisheries Commission. 2000. Technical Addendum 1 to Amendment 1 of the Interstate Fishery Management Plan for shad and river herring. February 9, 2000.

Atlantic States Marine Fisheries Commission. 2008. Amendment 2 to the Interstate Fishery Management Plan for American eel. Arlington, Virginia. October 2008.

Atlantic States Marine Fisheries Commission. 2009. Amendment 2 to the Interstate Fishery Management Plan for shad and river herring. Arlington, Virginia. May 2009.

Atlantic States Marine Fisheries Commission. 2010. Amendment 3 to the Interstate Fishery Management Plan for shad and river herring, Arlington, Virginia. February 2010.

Atlantic States Marine Fisheries Commission. 2013. Amendment 3 to the Interstate Fishery Management Plan for American eel. Arlington, Virginia. August 2013.

Atlantic States Marine Fisheries Commission. 2014. Amendment 4 to the Interstate Fishery Management Plan for American eel. Arlington, Virginia. October 2014.

Maine Atlantic Sea-Run Salmon Commission. 1984. Strategic plan for management of Atlantic salmon in the State of Maine. Augusta, Maine. July 1984.

Maine Department of Agriculture, Conservation, & Forestry. Maine State Comprehensive Outdoor Recreation Plan (SCORP): 2014-2019. Augusta, Maine.

Maine Department of Conservation. 1982. Maine Rivers Study-final report. Augusta, Maine. May 1982.

Maine Department of Marine Resources. Maine Department of Inland Fisheries and Wildlife. 2008. Strategic Plan for the Restoration of Diadromous Fishes to the Penobscot River. Augusta, Maine. March 2008

Maine Department of Marine Resources. Maine Department of Inland Fisheries and Wildlife. 2008. Operational Plan for the Restoration of Diadromous Fishes to the Penobscot River. Augusta, Maine. July 2, 2009.

Maine State Planning Office. 1987. Maine Comprehensive Rivers Management Plan Vols 1-3. Augusta, Maine. May 1987.

Maine State Planning Office. 1992. Maine Comprehensive Rivers Management Plan. Volume 4. Augusta, Maine. December 1992.

National Marine Fisheries Service. 1998. Final Amendment #11 to the Northeast Multi-species Fishery Management Plan; Amendment #9 to the Atlantic sea scallop fishery Management Plan; Amendment #1 to the Atlantic salmon Fishery

Management Plan; and Components of the Proposed Atlantic herring Fishery Management Plan for Essential Fish Habitat. Volume 1. October 7, 1998.

National Marine Fisheries Service. 2018. Recovery Plan for the Gulf of Maine Distinct Population Segment of Atlantic Salmon. Hadley, Massachusetts. January 2019.

National Park Service. 1993. The Nationwide Rivers Inventory. Department of the Interior, Washington, D.C.

U.S. Fish and Wildlife Service. 1989. Atlantic salmon restoration in New England: Final environmental impact statement 1989-2021. Department of the Interior, Newton Corner, Massachusetts. May 1989.

U.S. Fish and Wildlife Service. n.d. Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service. Washington, D.C.

U.S. Fish and Wildlife Service. Canadian Wildlife Service. 1986. North American waterfowl management plan. Department of the Interior. Environment Canada. May 1986.

## 9.0 MAILING LISTS

The lists below, in this scoping document, are the Commission's official mailing lists for the Projects. If you want to receive future mailings for these proceedings and are not included in the lists below, please send your request by email to efiling@ferc.gov, or by mail to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 888 First Street, N.E., Room 1A, Washington, DC 20426. Submissions sent via any other carrier must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 12225 Wilkins Avenue, Rockville, Maryland 20852. All written and emailed requests to be added to the mailing lists must clearly identify the following on the first page, as appropriate: **Ripogenus Hydroelectric Project (P-2572-133)** and/or **Penobscot Mills Hydroelectric Project (P-2458-247).** You may use the same method if requesting removal from the mailing lists below.

Register online at http://www.ferc.gov/docs-filing/esubscription.asp to be notified via email of new filings and issuances related to these Projects or other pending projects. For assistance, please contact FERC Online Support at Mailto:FERCOnlineSupport@ferc.gov, or toll free at 1-866-208-3676, or for TTY, (202) 502-8659.

**Ripogenus Project Mailing List**

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|---|---|
| John T Eddins<br>Advisory Council on Historic Preservation<br>401 F Street N.W. Suite 308<br>Washington, DC 20001-2637 | Kevin Richard Colburn<br>National Stewardship Director<br>American Whitewater<br>1035 Van Buren Street<br>Missoula, MT 59802 |
| P. Andrew Hamilton<br>Eaton, Peabody, Bradford & Veague, P.A.<br>PO Box 1210<br>Bangor, ME 04402-1210 | John E. Rouleau<br>Chairman<br>Town of East Millinocket<br>53 Main St<br>East Millinocket, ME 04430-1126 |
| Vernon E. Haines<br>Fin and Feather Club<br>PO Box 123<br>Millinocket, ME 04462-0123 | John A. O'Leary<br>Great Bay Hydroelectric Associates<br>76 Thatcher St<br>Westwood, MA 02090-2527 |
| Kathy Davis Howatt<br>Hydropower Coordinator<br>Maine Department of Environmental Protection<br>17 State House Station<br>Augusta, ME 04333-0017 | John Perry<br>Environmental Coordinator<br>Maine Department of Inland Fisheries and Wildlife<br>284 State Street<br>Augusta, ME 04333-0041 |
| Gail Wippelhauser<br>Marine Resources Scientist<br>Maine Department of Marine Resources<br>21 State House Station<br>Augusta, ME 04333 | Kelly Maloney<br>Brookfield Renewable<br>Manager, Licensing and Compliance<br>150 Main Street<br>Lewiston, MAINE 04240 |
| Matthew Manahan<br>Attorney<br>Pierce Atwood LLP<br>Merrill's Wharf<br>254 Commercial Street<br>Portland, ME 04101 | Martin Eisenstein<br>Brann & Isaacson<br>PO Box 3070<br>Lewiston, ME 04243-3070 |
| Executive Director<br>Maine Audubon Society<br>20 Gilsland Farm Rd<br>Falmouth, ME 04105-2100 | Patrick McTeague<br>McTeague, Higbee, Case, Cohen,<br>Whitney & Toker, P.A.<br>PO Box 5000<br>Topsham, ME 04086-5000 |

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|---|---|
| Erich Veyhl<br>Maine Conservation Rights Institute<br>24 Orchard Rd<br>Concord, MA 01742-3202 | Steven Tuckerman<br>Maine Flow<br>67 Litchfield Ave<br>Rutland, VT 05701-3511 |
| Richard E. Hill<br>Maine Professional Guides Association<br>55 Morrison Hill Rd<br>Wilton, ME 04294-4040 | Director<br>Maine Professional River Outfitters<br>PO Box 669<br>Millinocket, ME 04462-0669 |
| Eric Givens<br>Maine Sporting Camp Association<br>PO Box 119<br>Millinocket, ME 04462-0119 | Peter L. Pray<br>Pray's Big Eddy Campground, Inc.<br>PO Box 548<br>Millinocket, ME 04462-0548 |
| Thomas C. Nannery<br>Sportsman's Alliance of Maine<br>RR 1 Box 1174<br>Augusta, ME 04330-9801 | U.S. Army Corps of Engineers<br>Divisional Office, Regulatory<br>696 Virginia Rd<br>Concord, MA 01742-2718 |
| Jay Clement<br>U.S. Army Corps of Engineers<br>675 Western Avenue<br>Manchester, ME 04351 | Andrew Tittler<br>Attorney-Advisor<br>U.S. Department of Interior<br>15 State St.<br>8th Floor<br>Boston, MA 02109-3502 |
| U.S. National Park Service<br>North Atlantic Region<br>15 State St<br>Boston, MA 02109-3502 | Fred Miller<br>President<br>United Plant Guard Workers of America<br>119 Wheaton Rd<br>Dover Foxcroft, ME |

**Penobscot Mills Project Mailing List**

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|---|---|
| John T Eddins<br>Advisory Council on Historic Preservation<br>401 F Street N.W. Suite 308<br>Washington, DC 20001-2637 | Kevin Richard Colburn<br>National Stewardship Director<br>American Whitewater<br>1035 Van Buren Street<br>Missoula, MT 59802 |
| P. Andrew Hamilton<br>Eaton, Peabody, Bradford & Veague, P.A.<br>PO Box 1210<br>Bangor, ME 04402-1210 | John E. Rouleau<br>Chairman<br>Town of East Millinocket<br>53 Main St<br>East Millinocket, ME 04430-1126 |

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|---|---|
| Vernon E. Haines<br>Fin and Feather Club<br>PO Box 123<br>Millinocket, ME 04462-0123 | John A. O'Leary<br>Great Bay Hydroelectric Associates<br>76 Thatcher St<br>Westwood, MA 02090-2527 |
| Kathy Davis Howatt<br>Hydropower Coordinator<br>Maine Department of Environmental Protection<br>17 State House Station<br>Augusta, ME 04333-0017 | John Perry<br>Environmental Coordinator<br>Maine Department of Inland Fisheries and Wildlife<br>284 State Street, 41 SHS<br>Augusta, ME 04333-0041 |
| Gail Wippelhauser<br>Marine Resources Scientist<br>Maine Department of Marine Resources<br>21 State House Station<br>Augusta, ME 04333 | Kelly Maloney<br>Brookfield Renewable<br>Manager, Licensing and Compliance<br>150 Main Street<br>Lewiston, ME 04240 |
| Matthew Manahan<br>Attorney, Pierce Atwood LLP<br>Merrill's Wharf<br>254 Commercial Street<br>Portland, ME 04101 | Jeff Russell<br>Bloomer Russell Beaupain<br>175 Exchange Street<br>Suite 200<br>Bangor, ME 04401 |
| Executive Director<br>Maine Audubon Society<br>20 Gilsland Farm Rd<br>Falmouth, ME 04105-2100 | Patrick McTeague<br>McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A.<br>PO Box 5000<br>Topsham, ME 04086-5000 |
| Erich Veyhl<br>Maine Conservation Rights Institute<br>24 Orchard Rd<br>Concord, MA 01742-3202 | Bryant Davis<br>President<br>Fin and Feather Club of Maine<br>PO Box 123<br>Millinocket, ME 04462 |
| Richard E. Hill<br>Maine Professional Guides Association<br>55 Morrison Hill Rd<br>Wilton, ME 04294-4040 | John Dicentes<br>President<br>International Assn of Machinists, et al.<br>64 Congress St<br>Millinocket, ME 04462-1312 |
| Eric Givens<br>Maine Sporting Camp Association<br>PO Box 119<br>Millinocket, ME 04462-0119 | Maine Department of Conservation<br>22 State House Sta<br>Augusta, ME 04333-0022 |

| | |
|---|---|
| Maine Department of Inland Fisheries and Wildlife<br>41 State House Station<br>284 State Street<br>Augusta, ME | U.S. Army Corps of Engineers<br>Divisional Office, Regulatory<br>696 Virginia Rd<br>Concord, MA 01742-2718 |
| Jay Clement<br>U.S. Army Corps of Engineers<br>675 Western Avenue<br>Manchester, ME 04351 | Andrew Tittler<br>Attorney-Advisor<br>U.S. Department of Interior<br>15 State St., 8th Floor<br>Boston, MA 02109-3502 |
| U.S. National Park Service<br>North Atlantic Region<br>15 State St<br>Boston, MA 02109-3502 | Fred Miller<br>President<br>United Plant Guard Workers of America<br>119 Wheaton Rd<br>Dover Foxcroft, ME |
| Maine Department of Marine Resources<br>Hallowell Annex-Baker Building<br>State House Station 21<br>Augusta, ME 04333-0001 | Kathleen Leyden<br>Director, Maine Coastal Program<br>Maine Department of Agriculture, Cons. & Forestry<br>93 State House Station<br>Augusta, ME 04333-0038 |
| Director<br>Maine Department of Economic and Community<br>Development Energy Conservation Div.<br>59 State House Sta.<br>Augusta, ME 04333-0059 | Maine Historic Preservation Commission<br>Environmental Review Coord.<br>55 Capitol St<br>65 State House Station<br>Augusta, ME 04333-0065 |
| Maine Office of Attorney General<br>State House Station 6<br>Augusta, ME 04330 | Director<br>Maine Professional River Outfitters<br>PO Box 669<br>Millinocket, ME 04462-0669 |
| Maine State Extension Service<br>University of Maine<br>102 Libby Hall<br>Orono, ME 04469-0001 | Director<br>Maine Soil & Water Conservation Comm<br>Station #28<br>Deering Bldg., AMHI Complex<br>Augusta, ME 04333-0001 |
| Town of Millinocket<br>197 Penobscot Ave.<br>Millinocket, ME 04462-1430 | NOAA<br>NEPA Coordinator<br>Office of Program Planning & Integration<br>1315 East-West Highway<br>Silver Spring, MD 20910 |

| | |
|---|---|
| Board of County Commissioners<br>County of Penobscot<br>97 Hammond St<br>Bangor, MAINE 04401-4913 | John McDevitt<br>Save our Scenic Lakes Association<br>5 Pleasant St.<br>Burlington, MA 01803-2726 |
| Harold Peterson<br>Natural Resources Officer<br>Bureau of Indian Affairs<br>545 Marriott Drive Ste 700<br>Nashville, TN 37214 | Amanda Bossie<br>Office of the Solicitor<br>U.S. Department of Interior<br>INC000000251348<br>Boston, MA 02109 |
| Director<br>U.S. Environmental Protection Agency<br>Office of Ecosystem Protection<br>Water Quality Branch<br>5 Post Office Sq, Ste 100<br>Boston, MA 02109-3912 | Kevin Mendik, ESQ<br>NPS Hydro Prgm Coord<br>U.S. National Park Service<br>15 State Street<br>10th Floor<br>Boston, MA 02109 |

**APPENDIX A**
**STUDY PLAN CRITERIA**
**18 CFR Section 5.9(b)**

Any information or study request must contain the following:

1. Describe the goals and objectives of each study proposal and the information to be obtained;

2. If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;

3. If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;

4. Describe existing information concerning the subject of the study proposal, and the need for additional information;

5. Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements;

6. Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate filed season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge; and

7. Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs.

## APPENDIX B
## RIPOGENUS PROJECT AND PENOBSCOT MILLS PROJECT PROCESS PLAN AND SCHEDULE

Shaded milestones are unnecessary if there are no study disputes. If the due date falls on a weekend or holiday, the due date is the following business day. Early filings or issuances will not result in changes to these deadlines.

| Responsible Party | Pre-Filing Milestone | Date | FERC Regulation |
|---|---|---|---|
| Licensees | Issue Public Notice for NOI/PAD | 6/11/21 | 5.3(d)(2) |
| Licensees | File NOI/PAD | 6/11/21 | 5.5, 5.6 |
| FERC | Tribal Meetings, if needed | TBD | 5.7 |
| FERC | Issue Notice of Commencement of Proceeding and Scoping Document 1 | 8/10/21 | 5.8 |
| FERC | Scoping Meetings | 9/9/21 | 5.8(b)(viii) |
| All Stakeholders | File Comments on PAD/Scoping Document 1 and Study Requests | 10/9/21 | 5.9 |
| FERC | Issue Scoping Document 2 (if necessary) | 11/23/21 | 5.10 |
| Licensees | File Proposed Study Plan | 11/23/21 | 5.11(a) |
| All Stakeholders | Proposed Study Plan Meeting | 12/23/21 | 5.11(e) |
| All Stakeholders | File Comments on Proposed Study Plan | 2/21/22 | 5.12 |
| Licensees | File Revised Study Plan | 3/23/22 | 5.13(a) |
| All Stakeholders | File Comments on Revised Study Plan | 4/7/22 | 5.13(b) |
| FERC | Issue Director's Study Plan Determination | 4/22/22 | 5.13(c) |
| Mandatory Conditioning Agencies | File Any Study Disputes | 5/12/22 | 5.14(a) |
| Dispute Panel | Select Third Dispute Resolution Panel Member | 5/27/22 | 5.14(d) |
| Dispute Panel | Convene Dispute Resolution Panel | 6/1/22 | 5.14(d)(3) |
| Licensees | File Comments on Study Disputes | 6/6/22 | 5.14(i) |

| Responsible Party | Pre-Filing Milestone | Date | FERC Regulation |
|---|---|---|---|
| Dispute Panel | Dispute Resolution Panel Technical Conference | 6/11/22 | 5.14(j) |
| Dispute Panel | Issue Dispute Resolution Panel Findings | 7/1/22 | 5.14(k) |
| FERC | Issue Director's Study Dispute Determination | 7/21/22 | 5.14(l) |
| Licensees | First Study Season | Spr/Sum 22 | 5.15(a) |
| Licensees | File Initial Study Report | 4/22/23 | 5.15(c)(1) |
| All Stakeholders | Initial Study Report Meeting | 5/7/23 | 5.15(c)(2) |
| Licensees | File Initial Study Report Meeting Summary | 5/22/23 | 5.15(c)(3) |
| All Stakeholders | File Disagreements/Requests to Amend Study Plan | 6/21/23 | 5.15(c)(4) |
| All Stakeholders | File Responses to Disagreements/ Amendment Requests | 7/21/23 | 5.15(c)(5) |
| FERC | Issue Director's Determination on Disagreements/Amendments | 8/20/23 | 5.15(c)(6) |
| Licensees | Second Study Season | Spr/Sum 23 | 5.15(a) |
| Licensees | File Updated Study Report | 4/21/24 | 5.15(f) |
| All Stakeholders | Updated Study Report Meeting | 5/6/24 | 5.15(f) |
| Licensees | File Updated Study Report Meeting Summary | 5/21/24 | 5.15(f) |
| All Stakeholders | File Disagreements/Requests to Amend Study Plan | 6/20/24 | 5.15(f) |
| All Stakeholders | File Responses to Disagreements/ Amendment Requests | 7/20/24 | 5.15(f) |
| FERC | Issue Director's Determination on Disagreements/Amendments | 8/19/24 | 5.15(f) |
| Licensees | File Preliminary Licensing Proposal (or Draft License Application) | 5/3/24 | 5.16(a)-(c) |
| All Stakeholders | File Comments on Preliminary Licensing Proposal (or Draft License Application) | 8/1/24 | 5.16(e) |
| Licensees | File Final License Application | 9/30/24 | 5.17 |

| Responsible Party | Pre-Filing Milestone | Date | FERC Regulation |
|---|---|---|---|
| Licensees | Issue Public Notice of Final License Application Filing | 10/14/24 | 5.17(d)(2) |

Stephen Condren, Boxborough, MA.
Iâ€™ve been fishing the West Branch of the Penobscot for 20 years, most during relatively high flows, greater than 2,400 cfs. During the past 2 years, following reduced snow cover and drought conditions, the flows have been lower at times, 1,700 to 2,200. Iâ€™ve seen large sections of river bottom exposed along the banks and noticed reduce insect activity. Anecdotal and without studies to back it up, but I believe the low flows and exposed river bottom areas have adversely impacted the aquatic lifeforms of the insects. Any relicensing should address minimum flows that ensure a healthy environment for all river life.

Document Accession #: 20210908-0041 Filed Date: 09/08/2021

MAINE HISTORIC PRESERVATION COMMISSION
55 CAPITOL STREET
65 STATE HOUSE STATION
AUGUSTA, MAINE
04333

JANET T. MILLS
GOVERNOR

KIRK F. MOHNEY
DIRECTOR

FILED
SECRETARY OF THE
COMMISSION

ORIGINAL

2021 SEP -8 A 2:38

FEDERAL ENERGY
REGULATORY COMMISSION

August 30, 2021

Secretary Kimberly D. Bose
Federal Energy Regulatory Commission
888 First Street NE
Room 1A
Washington DC 20426

Project: MHPC# 1049-21 FERC 2572-133 Ripogenus Hydro; FERC 2458-257 Penobscot Mills Hydro
Scoping Document

Town: Various, ME

Dear Secretary Bose:

I am writing in response to the FERC's "Scoping Document 1 for the Ripogenus Hydroelectric Project (P-2572-133) and Penobscot Mills Hydroelectric Project (P-2458-247)" which was received in our office on August 19, 2021.

In my opinion, the FERC's scoping document does not adequately address cultural resources including archaeological sites around the impoundment margin and any architectural resources within the impoundment area. We have previously commented that a Phase I and possibly subsequent archaeological studies are necessary to determine site presence/absence, effect on sites from erosion, and possible National Register eligibility.

Our office stands by our June 29, 2021 recommendations for architectural and archaeological surveys (see attachment).

Please contact Megan Rideout at (207) 287-2992 or megan.m.rideout@maine.gov if we can be of further assistance in this matter.

Sincerely,

Kirk F. Mohney

Kirk F. Mohney
State Historic Preservation Officer

PHONE: (207) 287-2132 FAX: (207) 287-2335

MAINE HISTORIC PRESERVATION COMMISSION
55 CAPITOL STREET
65 STATE HOUSE STATION
AUGUSTA, MAINE
04333

JANET T. MILLS
GOVERNOR

KIRK F. MOHNEY
DIRECTOR

June 29, 2021

Ms. Cate Russell
HDR
970 Baxter Blvd
Suite 301
Portland, ME 04103

Project: MHPC #1049-21 Great Lakes Hydroelectric; Ripogenus FERC 2572; Penobscot Mills FERC 2458
NOI License Application

Town: Various, ME

Dear Ms. Russell:

In response to your recent request, I have reviewed the information received June 14, 2021 to initiate consultation on the above referenced project in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended.

The area of potential effect as noted on page 5-252 is "defined as all lands and waters within the Project Boundary.... This includes the area where Project operations or Project-related recreation activities or other enhancements may cause changes in the character or use of historic properties." Based on this definition of the APE, it is unclear from the discussion in Section 5.10.2 as to whether the entire Project Boundary was surveyed for architectural resources during the prior re-licensing effort. If such a survey was not conducted, or if it needs to be updated to identify other properties that are now 50 years of age or older, the Commission recommends that the applicant undertake further studies to identify all properties in the APE that may be eligible for listing in the National Register of Historic Places.

An architectural survey is recommended to identify and record information on all resources within the area of potential effect (APE) that are at least 50 years old. Survey must be completed according to our "Revised Above Ground Cultural Resource Survey Manual Project Review Specific." All surveys must be submitted electronically via our on-line CARMA database. See our website for more information: https://www.maine.gov/mhpc/quick-links/forms-instructions

A list of historic preservation consultants who are qualified to conduct architectural survey and have been trained in the use of the CARMA database may be found at the following page of our website: https://www.maine.gov/mhpc/programs/survey/approved-consultants/carma-trained-consultants

The archaeological resources section of the PAD (pp. 5-254 through 5-268 for Ripogenus and 5-265 through 5-268 for Penobscot Mills) accurately summarized archaeological mitigation work to date on the sites listed in the HPMP for the October 1996 license. No further Phase I or Phase II archaeological survey is necessary. Mitigation archaeological work not yet completed for the 1996 license should be brought forward for an HPMP for the 2026 license. Continued analysis and reporting on excavated sites (e.g. p5-261 and 5/262) should be a priority. Attempts to access the sites that have been difficult to access because of water levels or landowner permissions should continue.

After the 1996 license, a major archaeological collection (the Dan Hurld collection) primarily from the Penobscot Mills project area was acquired by the Maine State Museum. This collection consists of over 1000

stone tools and several hundred pieces of Native American ceramics, recovered during periods of low water on the Penobscot Mills lakes by Dan Hurld between about 1930 and 1955. The artifacts are marked by site location and can be attributed to specific archaeological sites by site number. This collection will provide a major increase in cultural context (age of occupation, types of artifacts at each site) when combined with existing information from the Phase I, II and mitigation work. We request that a professional analysis of the Dan Hurld collection, and integration of the information contained within it to the known site information be undertaken and funded as part of the HPMP for the 2026 license, or as work in advance of license issuance. This is appropriate mitigation for the effects of the raised water levels on the Penobscot Mills impoundments on scores of archaeological sites around the impoundment.

If you have any questions regarding archaeology, please contact Dr. Arthur Spiess of this office at Arthur.Spiess@maine.gov.

Please contact Megan M. Rideout of our staff at 287-2992 or megan.m.rideout@maine.gov if you have any questions regarding above ground resources.

Sincerely,

Kirk F. Mohney

Kirk F. Mohney
State Historic Preservation Officer

Amanda Swanberg, Damariscotta, ME.
The Restorative Justice Institute of Maine (RJIM) supports the Penobscot Nation in their efforts to be reinstated as the rightful stewards of the West Branch of the Penobscot River. We acknowledge the Penobscot Nation as a sovereign nation which should have the rights to manage land, water, and fisheries resources on their native lands. We agree with the Penobscot Nation’s assessment that the West Branch ecosystem is adversely impacted by dams now owned by Brookfield and that decommissioning and removal is the only way to begin to restore the health of the river. We trust the Penobscot Nation to be stewards of this waterway for the benefit of their people, the people of Maine, and the ecosystems that depend on it. We believe transferring the rights of the river back to the Penobscot Nation is a necessary step in the decolonization of Maine’s natural resources. It is RJIM's mission to work with individuals and communities to promote community healing, and that healing past harms that have happened to the land and water is directly connected to this collective healing.

UNITED STATES OF AMERICA

FEDERAL ENERGY REGULATORY COMMISSION

Ripogenus Hydroelectric Project and
Penobscot Mills Hydroelectric Project
Great Lakes Hydro America, LLC

Project Nos: 2572-133, 2458-247

Thursday, September 9, 2021

SCOPING SESSION - TELECONFERENCE

Thursday, September 9, 2021

The Virtual Scoping Meeting, pursuant to notice, convened at 6:30 p.m.

P R O C E E D I N G S

6:30 p.m.

OPERATOR: Welcome and thank you for standing by. All participants will be in listen only, and I'm going to pass to Mr. Allan Creamer of FERC.

MR. CREAMER: Thank you very much. I apologize for the delay here. We just had some technical difficulties getting everything up and running. But welcome everyone to the Federal Energy Regulatory Commission's Virtual Scoping Meeting to for the Ripogenus Hydroelectric Project Number 2572, and the Penobscot Mills Hydroelectric Project Number 2458.

My name is Allan Kramer and I work in the Office of Energy Projects Division of Hydropower Licensing at FERC. And I am the project coordinator for these proceedings. Several other FERC staff are joining me today along with representatives of Great Lakes Hydro America, these folks are available to listen to you as you provide comments during our scoping session.

The purpose of scoping is to seek input on the specific concerns or environmental issues related to relicensing the projects, and to identify all projects that should be considered in our environmental document. And we'll begin by going over important meeting notes, and will continue with a short introductory to the licensing process

and schedule.

Great Lakes Hydro America will then provide a FERC presentation on the projects and their operation. Following Great Lakes Hydro America's presentation we will begin taking your comments. As we all know these virtual meetings are not routine for the Commission. It is in fact the first instance for hydro licensing. I thank everyone now for your patience while others are being heard.

As a point of clarification there will be no summary at the end of our meeting. You are finished after providing your comments, and you will be disconnected from the call. For those of you wishing to speak we have a Court Reporter in each of our virtual breakout rooms to transcript this evening's meeting.

This transcript will serve as part of the Commission's record in these proceedings. When prompted we ask that you please state and spell your name clearly, and provide information on any affiliation or group for which you are speaking before commenting.

After Commission staff's introduction to the licensing process and Great Lakes Hydro America's introductory to the project, you will be invited to the breakout rooms in the order we received your call. Please remain on hold until it is your turn to speak at which time you will be provided with five minutes. At the end of your

time the operator will disconnect you, and then we'll move to the next in line based on the order in which we were called in.

While during these meetings you cannot listen to other commentors as is typical in normal times at a scoping. I reminder you that a transcript of this scoping meeting will be placed on the Commission's website and E-Library. In advance, I want to advise the organizers of the call as well as Court Reporters that there may be times that we have no callers, and that is to be expected. However, we will keep the call open for the general public the entire duration of the meeting.

If you prefer not to speak today, wish to file comments for any other reasons, or if you have technical difficulties during the call, you can file written comments with the Commission by October 9, 2021. Instructions for filing written comments are on page 2, Paragraph O of our office sent 2021 notice. We encourage you to e-file your written comments.

For those of you who wish to be on FERC's official mailing list, please see the instructions on page 34 of our scoping document 1 also issued on August 10, 2021. Finally, we recommend that you go to FERC's website at www.FERC.gov and e-subscribe to the projects using Project Number E-2572 and/or E-2458 which are the project numbers

for the Ripogenus Project 2572, and the Penobscot Mills Project 2458.

During this you are notified of any filings with the Commission, or of any issuances by the Commission related to these projects. I'll now switch gears and introduce the licensing process and the schedule, and will then turn it over to Great Lakes Hydro for its introductions to the project.

Great Lakes Hydro America has chosen to relicense the Ripogenus and Penobscot Mills projects using the integrated licensing process, or ILP. The ILP is the Commission's default licensing process. The process is driven by process plans with defined timelines and deadlines for all participants, including Commission staff.

The first step in the process is the development of a preliminary application document which is prepared by the applicant after gathering information from resource agencies and other sources. The process is marked by early scoping as well as study plan development and resolution as any study disagreement.

The city criteria are used to develop focused and appropriate studies and a Commission approved study plan is developed in consultation with the stakeholders -- the specific criteria represented in Appendix A of scoping document one. There are two years of study which gives us

an opportunity to review study results and make adjustments to the study plan based on specific criteria.

Towards the end of the prefiling process the applicant is required to develop a preliminary licensing proposal, or draft license application that includes his proposal for relicensing the project. The process is defined to integrate stakeholder processes such as Commission's licensing process, the Maine Department of Environmental Protections, water quality certification process, consultation under the Endangered Species Act, and the federal agency inspection 18 prescription process, thereby improving the overall efficiency of the licensing process.

But where are we in the relicensing process with the Ripogenus and Penobscot Mills? The relicensing process begins with an applicant filing its notice of intent in a preliminary application document. Great Lakes Hydro America filed these documents on June 11, 2021.

Commission staff issued a scoping document one for the project, and the Commission issued a public notice for the proceeding on August 10, 2021. Commission staff is holding virtual public scoping meetings, and Great Lakes Hydro America is conducting a virtual environmental site scoping process today, September 9, 2021.

Stakeholders then have an opportunity to file

comments on this project on a preliminary application process, as well as file study requests by October 9, 2021. Once the comment periods ends Great Lakes Hydro America will prepare a proposed study plan which is due on November 23, 2021.

There will be a meeting to discuss the proposed study plan on or around December 23, 2021. This represents an informal opportunity to resolve this agreement with studies. Comments on the preferred study plan are due by February 21, 2022, after which Great Lakes Hydro America will file a revised study plan.

The Commission will issue its study plan determination by April 22, 2022. If necessary there has been a formal dispute resolution process that follows issuance of the study plan determination. The ILP provides for two years of studies which for these projects occur in 2022 and 2023. Great Lakes Hydro America will file an initial study report by April 21, 2023, and a final study report by April 21, 2024.

Meetings will be held for each report. Great Lakes Hydro America will then file a preliminary licensing proposal or, PLP, by May 3, 2024. Stakeholder comments on the PLP are due by August 1, 2024. The refiling part of the process wraps up the Great Lakes Hydro America's filings. License application must be filed by September 30, 2024.

I know I have gone through a lot of information in a short period of time. What I presented is intended to be an overview of the process and the schedule. The details can be found in Appendix B of scoping document one. Also, as you can see, this is a fast-moving process, especially in the first 10 months, and it is a process that provides for stakeholder involvement throughout.

At this point I'm going to turn the meeting over to representatives from Great Lakes Hydro America for a short introduction to the projects.

MR. DORMAN: Thank you Allan. Good evening everyone. Thank you for dialing in tonight. My name is Randall Dorman for GLHA, and I'll be in charge of leading the relicensing of the west branch projects, Penobscot Mills and Ripogenus license projects.

I'm going to provide a very brief overview of these two projects, but it's worth noting that they are very large, and they're very complex, and so it's going to be hard to convey all of the relationship between these components over the phone.

And so I strongly urge anyone who hasn't had the opportunity to take a look at our preapplication document. Allan eluded to this in his introduction. This was something we had filed back on June 11. It's available on FERC's website. And what this document does is it gives an

overview of our project facilities, our project operations, and it summarizes everything we could find on resources associated with the project.

So anything affected by the project is summarized in the reapplication document. We tried very hard to provide as clear an through a description of our project facilities and operations, and I'm hoping that when you get a chance to take a look at it it's a helpful guide for you.

So with that said on to the description of the project. These facilities are licensed under two separate FERC licenses, so we have Ripogenus which is licensed in Project Number 2572, and then we have Penobscot Mills which is licensed as Project 2458. And although they are separate licenses and will file separate license applications for them, they both have the same expiration dates.

They are right above each other on the west branch, and so we elected to relicense them essentially as a single unit in order to pick up some efficiencies and reduce paperwork and the amount of meetings. So that was why we've chosen to do this the way we have.

So what I will do now is I'm just going to walk through a very high level overview of the project. I'm going to stop at the top of our system and I'm going to work down through each of the facilities and so we'll start with the Ripogenus Project, and we have one kind of interesting

development which is part of the project. It is a wetlands mitigation project that came out of the last licensing, but it's not a functioning working reservoir, so we aren't manipulating flows up there to affect the project.

The water is just flowing out of that naturally run of river because it's like I said, it's a run of river mitigation project that we had established. But water runs down from the Misoukis [ph] into the Ripogenus impoundment. And the Ripogenus impoundment has several sub-bases within it that are part of that larger impounded, you have Ambajejus Lake, you have Caribou Lake, you have Chesuncook Lake, you have Blue Span, Brandy Pond, and Black Pond, all of these are part of that Ripogenus impoundment which is created by the Ripogenus span.

There are no generating facilities at the dam itself. Water is diverted down to the McKay Station, which is the generating station associated with Ripogenus. So McKay is a 37.5 megawatt generating facility. Water goes into McKay, it's dispersed back into the west branch, and then that is largely the end of project's features associated with the Ripogenus. If you saw a map you could see the footprint of it.

You can look at the size, it's pretty enormous. We've got almost 30,000 acres of impoundments. But it's primarily those two facilities, Ripogenus and McKay Station.

There is a very long transmission line that is part of the project, but in terms of river frontage really we don't go much below McKay Station as part of Ripogenus.

So that's it for that project. And now I'll talk a little bit about the Penobscot Mill Project which is much more complicated because it has many more moving pieces so to speak. So I'll start at the top of Penobscot Mills Project with the North Twin impoundment. And again the North Twin impoundment like Ripogenus is composed of these separate sub-basins that are part of that.

North Twin includes Elbow Lake, North Twin Lake, South Twin Lake, Pemadumcook Lake, and the Ambajejus Lake. So water from McKay goes down the west branch, to reach these North Twin impoundments. We also have as part of this system Millinocket Lake which we can pump water from into North Twin if we need augment flows.

From North Twin water then flows to North Twin generating station, that's a 6.9 megawatt facility. Water from North Twin is then cast down into Millinocket Lake, and again Millinocket consists of Quakish Lake and Ferguson Pond. And at Millinocket Lake we have two components there. We have Stone Dam, and then we have Millinocket Station. So most of the water is diverted by a stone dam into Millinocket Station, that's a 37.4 megawatt station.

From Millinocket it arches back downstream,

enters that pond which is actually outside of the project boundary. That pond the water travels to Dolby impoundment, and from Dolby the water runs through Dolby Station a, 16.5 megawatt station, pass from Dolby back into the west branch, follows the river down to the East Millinocket impoundment. This is our smallest impoundment in this system.

And then from East Millinocket goes to East Millinocket Station, which is a 7 megawatt station, and then from there goes back into the west branch, and that's the bottom of our project. So there are some very helpful illustrations, some maps, all of the maps of these projects in that pad, as well as a very handy diagram.

I'm not going to kid you I'm looking at this diagram as I'm going through this description. This facility, it very clearly lays out where the water is going. It also has specific details on how much water and when some of these operating requirements we have are in place. So again, I'll make my last pitch for the preapplication document here, because I just really think it will be a useful reference document for you to look at.

And with that Allan, I think that concludes my overview of the project there.

MR. CREAMER: Thank you Randy. That's it Julie, we are ready to begin our comments.

OPERATOR: Thank you. One moment.

(Plays recording.) Written comments are given equal consideration.

We will go ahead and place you in your break-out rooms. Just to confirm where did Steve go?

UNIDENTIFIED SPEAKER: Steven, place him over in Room 1.

OPERATOR: Room 1, okay. All right.

MADDISON: My name is Maddison and I'll be recording your break out room today. Just let me know when everybody is ready to speak to our first person.

MR. GIBSON: Yes good evening, this is Jim Gibson. Also here, this is Kevin Bernier.

MS. BLY: And Wendy Bly with Quantra Associates, I'm good.

MS. PHILIP: Christine Philip with FERC, I'm good.

MR. TERHAAR: Monte with FERC I'm good.

OPERATOR: Okay perfect. Okay thank you. I will be giving the -- there for spelling correct, they won't be doing this --

We're waiting for them to spell it themselves, spell it and announce themselves.

UNIDENTIFIED SPEAKER: I think that's brilliant. A question for the Court Reporter. Is there a preference there?

REPORTER: I'm sorry would you say that again?

OPERATOR: Yes would you like us to -- the operator, would you like me to acknowledge and spell the name for each person, or would you prefer them to announce and spell their own name?

REPORTER: Sure if you can like saying the next speaker, the name and if you spell it out that would be nice if you can.

OPERATOR: Okay perfect, thank you.

REPORTER: You're welcome.

OPERATOR: Our first participant is Sarah, S-A-R-A-H, S-I-N-G-O. Hello, and thank you for participating. You are now in the room to provide your comments to the Court Reporter. You will have five minutes to speak. I will give you a warning when you have 30 seconds remaining. You may begin, thank you.

And it looks like we have Sarah disconnected, so Sarah is no longer with us. Ms. Singo is no longer in the room. I will let you know when we have another person in the room.

REPORTER: Okay.

OPERATOR: Thank you.

We have Angela Reed, A-N-G-E-L-A R-E-E-D. Hello, you are now in the room to provide your comments to the Court Reporter. you will have five minutes

to speak. I will give you a warning when you have 30 seconds remaining. Please state and spell your name for the record, and state if you are on behalf of a group of an affiliation. You may begin.

MS. REED: Hello Thank you for taking my comments. My name is Angela Reed, A-N-G-E-L-A R-E-E-D. I am just representing myself as a private citizen. My first comment is I know that you guys have to do this virtually, but it seems like with the technology today we could have had an ability to see documents online, have some kind of visual component as well as maybe an question an answer session.

The second thing is I'm wondering if there will be studies done. I think there needs to be studies done on the reliability of options of getting better fish passage at the very least on these projects, and whether we still need these projects. Do we need to still have dams given the increase in other renewable power projects that there are coming up throughout the world, but certainly also in Maine?

I think that we need to not be forsaking the entire west branch. It seems like the Penobscot River is somewhat of a misleading thing to say nowadays, but that these dams it ends up being a very long chain of lakes thrown together by some stone, -- and water. That is not a natural river eco-system, it's scarily managed, and does not

represent at all what organisms or people evolved with for thousands of years on this continent prior to the impoundments.

So it is my sincere desire that we do both some ecological analysis of both getting better fish passes released again, as the Commission stands, but also not only ecological, but financial analysis of how much hydropower do these -- how much power, excuse me, do these contribute to the overall scenario, and what would happen if we didn't have them? What would the result be?

I think the history of this is Penobscot Mills is obviously very different in this day and age. It needs to be considering that people are coming here to recreate, and more so nowadays, and that may be extra benefitted by not having as many of these kinds of dams in the area as there are, but I think we need to do some kind of analysis on what are the options, and really you guys need to do a better job of getting the word out to the public, and putting it in a more understandable way, and allowing people to ask questions and give more opportunity for people to really understand the impacts that are such a huge component of when you really talk about for Maine, the way life should be, and vacation land.

I think we need to really give people an honest perspective on what happens to the "natural resources" of

the state, and how we are going to protect them for the future. I'm done. I know I probably haven't taken up my five minutes, but I think I'm done.

FERC: Thank you for your comments. We will include your comments in the public record for this project. And they will be considered in the review for this project. You may now end the call.

MS. REED: Okay thanks.

OPERATOR: Okay perfect. And I will let you know when our next participant is in here.

MR. PAONE: Yes I am here.

OPERATOR: Our next participant is Charles Paone. C-H-A-R-L-E-S P-A-O-N-E. Hello, and thank you for participating. You are now in the room to provide your comments to the Court Reporter. You will have five minutes to speak. I will give you a warning when you have 30 seconds remaining. Please state whether you are speaking on behalf of a group, or affiliation when you begin your comments. Thank you. You may begin.

MR. PAONE: Yes. My name is Charles Paone, and I am making these comments as a property owner on Caribou Lake. A review of this filing raises concerns regarding the impact, the annual drawdown of Ripogenus impoundment has on the water levels with Caribou Lake.

By early to mid-summer Caribou Lake often

experiences a significant reduction in water levels, even beyond the last two drought years. This reduction in water level and exposures of the lake beds make it very difficult for access to the lake from the many houses located on it.

Further, with such low-levels of water navigation has become very hazardous, and access to Chesuncook and Ripogenus Lakes from Caribou Lake is almost impossible, and likely to be impossible by the end of this month. The Caribou boat launch is frequently made useless due to the law water levels in the summer.

The preapplication document states that the full pond elevation during normal times is 941.6 feet. It further states during normal operation in normal in-flow years, the Ripogenus impoundment elevation is held relatively stable at 941.6 feet during summer months, and is gradually drawn down in the fall with a target low elevation of 913.6 feet by late winter in anticipation of the spring thaw and high flows.

I have been on Caribou Lake since 1968, and it frequently seems significant reductions of water and increases in the lake bed exposure during summer months often in excess of 50 to 60 feet. In paragraph 3.1.4 proposed environmental measures, GLHA proposes to continue to operate and maintain certain environmental measures.

These measures include certain recreational

resources such as white water boat flows operate and maintain 11 recreational sites. A commitment to continue to collect recreational use information during -- I'm sorry, use information every six years. However, none of these measures addresses adequate water levels at Caribou Lake, and the impact it has on the recreational use of the landowners and homeowners on Caribou Lake, all of whom have made a significant financial commitment to the area.

Since this license would establish the criteria for operation for the next 50 years, and given the obvious rapidly changing climate conditions that we have documented, or have been documented and well-established by many governmental agencies throughout the world, including NOAA, there needs to be a periodic review process to ensure that the critical assumptions -- I emphasize the critical assumptions used in developing the water usage criteria reflect today's environment and are adjusted in the future as necessary to reflect changing environmental conditions.

Assumptions such as normal water level in the impoundment, and normal inflows need to be continually monitored in order to determine what the appropriate outflow requirements should be. Certainly it is unrealistic to assume the water level requirements that were established some time ago will continue to be appropriate in the next 50 years, given the serious climate changes we are all

experiencing.

It would be helpful to better understand these issues if the following information could be provided. Number one, in what year was the normal full pond elevation of Ripogenus impoundment of 941.6 feet established? Number two, in paragraph 3.1.3 it is stated that Ripogenus impoundment elevation is held relatively stable at 941.6 feet during the summer months, and it's gradually drawn down starting in the fall.

OPERATOR: Excuse me, you do have 30 seconds left.

MR. PAONE: A review of studies and/or data for the last 10 years for the Ripogenus impoundment showing the actual normal elevation at the start of the summer per year, the actual elevation starting at the beginning of the fall per year, the actual maximum draw down per year, the actual low elevation by late winter per year.

Number three, is there any data for Caribou Lake regarding water levels, recreational impacts, or navigational issues.

OPERATOR: And excuse me, that is your five minutes.

MR. PAONE: Thank you.

FERC: Thank you for your comments, we will include your comments in the public record for this project,

and they will be considered in the review of the project. You may now end your call.

MR. PAONE: Thank you.

OPERATOR: Next we have Clayton Cole. C-L-A-Y-T-O-N C-O-L-E. Hello, and thank you for participating. You are now in the room to provide your comments to the Court Reporter. You will have five minutes to speak. I will give you a warning when you have 30 seconds remaining. Please state whether you are speaking on behalf of a group, or affiliation and then begin your comments. You may begin, thank you.

MR. COLE: I am here representing the Penobscot River Traveling Trail. We are an organization that has created a series of campsites starting in Midway every 10 miles to Tidewater into Bucksport and even beyond. Our campsites are available at no charge for river travels in paddled, manually propelled watercraft.

I have an interest in this relicensing process as it seems that it would affect how our paddling trail will work. We are concerned about river sustainability with respect to the Penobscot Nation. Also with managing regular close or river travel, and especially with wildlife and fish life.

I don't have a strongly held opinion at this time, but am very concerned about how the process will play

out. For now that is my comment.

FERC: Thank you for you comments. We will include your comments in the public record for this project, and they will be considered in the review for the project. You may now end the call. Thank you.

MS. BLY: This Wendy Bly. Is anybody else still in this meeting room?

MR. GIBSON: Yeah Wendy this is Jim.

MS. BLY: Okay just checking.

OPERATOR: And this is the operator. We currently don't have anybody dialed in to make comments, so I will let you know when we have somebody join in, but you'll hear the tone when they join as well, but currently we just don't have anybody dialed in. Thank you.

MR. GIBSON: And I get the impression the other room is the same way right now. I received a similar message from Kate.

MS. BLY: Yep. They're exactly the same. Everybody comes into like a main room, and then the main operator Julie, she divvies them up between the two rooms, so there's nobody dialed in at all currently. We're both kind of at a standstill.

MR. GIBSON: Thank you.

MS. BLY: You're welcome.

MR. GIBSON: While we have a moment is it

possible to read off the names again of the three speakers so far?

MS. BLY: Yes. We did have Sarah Singo, but they disconnected, that was the very first one. Our first one who actually spoke was Angela Reed.

MR. GIBSON: Okay.

MS. BLY: And then our next one was Charles Paone.

MR. GIBSON: Okay yep.

MS. BLY: And then our last one that just spoke was Clayton Cole.

MR. GIBSON: Thank you very much.

MS. BLY: You're very welcome.

OPERATOR: Next we have Stephen Bishop. S-T-E-P-H-E-N B-I-S-H-O-P. Hello, and thank you for participating. You are now in the room to provide your comments to the Court Reporter. You will have five minutes to speak. I will give you a warning when you have 30 seconds remaining. Please state whether you're speaking on behalf of a group or affiliation, then begin your comments. You may begin. Thank you.

MR. BISHOP: Thank you very much. Hi. Again my name is Stephen Bishop. I'm actually the President of the Penobscot Lot Owners Association, so I do have property on Ambajejus Lake, and I work with a lot of the Association,

with other people who have lots on Lake Ambajejus.

I am aware of the current process underway for reapplying for a license for Ripogenus Dam and other projects in 2024. I would just like to say I support the relicensing of the dams for the following reasons. While the dams generate electricity from Brookfield to sell, they also control water levels on the west branch in the connecting lakes.

Many people live on the lakes both in-season and year around. Many people make their living working on the lakes and rivers, rafters, flying service, main guides, game wardens, campgrounds, restaurants, and general stores to name a few. Additionally, many people who have live in Millinocket, East Millinocket and Midway work hard to make a living and support their families in jobs connected to the tourist industry supported by the local watershed.

These are the same people who lost their jobs when the mills closet. Would there be a consideration to decommission any of the dams along this watershed, or shut down any of these associated projects, I hope there's a study undertaken that examines the impact a closure will have on the livelihoods of people who depend on the watershed for their livelihood. Thank you very much.

OPERATOR: Thank you for your comments. We will include your comments in the public record for this project,

and they will be considered in the review of the project. You may now end your call. Thank you.

MR. BISHOP: All right thank you very much.

OPERATOR: And we don't have anybody else dialed in currently, sorry. He went through the prompts super quickly, so he came through, but currently we don't have anybody else, and I will let you know when we have somebody else dial in.

OPERATOR: Just to let you know we do have somebody dialed in. I'm pretty sure they will go to room one since we got the last person, but just to let you know.

OPERATOR: Next we have Ed Spear, E-D S-P-E-A-R. Hello, and thank you for participating. You are now in the room to provide your comments to the Court Reporter. You have five minutes to speak. I will give you a warning when you have 30 seconds remaining. Please state whether you're speaking on behalf of a group or affiliation and then begin your comment. You may begin, thank you.

MR. SPEAR: Good evening. My name is Ed Spear and I'm not affiliated. I was a biologist with -- internet interference Great Northern Paper and I went to work on the west branch in 1977 and concluded when Brookfield Green Lakes Hydro, a licensee took over. I was retiring.

I think my comments should be considered expert testimony, and I intend to eventually submit some written

comments. So we'll start with one general comment. The scoping document basically talks about how good things are, and I would like to remind FERC that when they issued the license back in 1996, they talked about how good everything was, including the salmon fishing.

And nothing can be farther from the truth. We looked right to the top location in 1992, and onto the town the EIS and the FEIS license was issued, it was then Great Northern Paper Company, and the river operated at I believe the EIS says relatively stable mode, and things would change.

Brookfield, Great Lakes Hydro, the licensee has gone into a peaking mode, and the results have been disastrous for the fish and the aquatic communities. The salmon fishing in the west branch lower McKay is generally now compressed to about a mile, a mile and half.

The salmon fishing flow, not Twin Dam, and the middle one, the Grinder one, I think it's now Mill one, Millinocket mill or something, has disappeared. And those are very likely results of the peaking operation. Peaking, and the literature was replete with this, is very, very tough on the fish and devastating on the aquatic communities, so.

I believe that if you look in the big A application and possibly in the -- application, you'll find

when Norman Go did a survey of macroinvertebrates and those studies are easily duplicated, that I'd like to also mention that Article 406 of the license talks about the whole brook side show, and the whole goal there was to provide -- try basically, and mostly try, and it was identified as a limiting factor that he took and with the present operation including today, even though I did move up, 1,000 or 100 depending how you take it.

Port workers basically do audits. Article 406 is moot. The evidence and the ramifications of peeking on juvenile salmon up and down the river is also especially in the Fry kind of damming, so those are the matrix you should really look into.

We should go back now and talk about what was formally called the rule tariff, which you might possibly call the Lake Water Management Plan, and as near as I can make out, there's no more water management plan. The water management plan is a time series of target zones for elevation in Rip Lake, and to some degree, a lesser degree in the Twin impoundment where you insure that you wouldn't run out of water in the winter, and at the rate we're going now there will be no water to meet any goals this winter.

So something has to be done to ensure that there's flows to meet environmental needs all the way through April 1, April 15. Some sort of water management

plan. People out west in the hydro projects stay out there, revisiting their water use plans. That can be a lot of different things.

So anyhow, the other thing which I would like to bring up is when I read the license. It seems to infer that someone is supposed to keep count of how power lake elevation generation. I'm sure that's happening.

OPERATOR: You do have 30 seconds left.

MR. SPEAR: Okay. I believe the slow data is on a computer somewhere but in an era of transparency, it's like looking for a black hole. FERC really needs to make the flow elevation -- the hourly flow and elevations for all the impoundments available to the public, and I'll let you go at that. I'll submit my written comments eventually, and thank you very much for your patience and good luck with what will surely be a long process.

OPERATOR: Thank you for your comments. We will include your comments in the public record for this project, and they will be considered in the review of the project.

MR. SPEAR: Thank you.

OPERATOR: You may now end the call thank you.

(Whereupon the meeting concluded at 8:41 p.m.)

CERTIFICATE OF OFFICIAL REPORTER

This is to certify that the attached proceeding before the FEDERAL ENERGY REGULATORY COMMISSION in the Matter of:

Name of Proceeding:
Ripogenus Hydroelectric Project and
Penobscot Mills Hydroelectric Project
Great Lakes Hydro America, LLC

Docket No.: Project Nos: 2572-133, 2458-247
Place: Virtual
Date: Thursday, September 9, 2021

were held as herein appears, and that this is the original transcript thereof for the file of the Federal Energy Regulatory Commission, and is a full correct transcription of the proceedings.

Meron Tesfaye
Official Reporter

UNITED STATES OF AMERICA

FEDERAL ENERGY REGULATORY COMMISSION

Office of Energy Projects

Virtual Scoping Meeting

Ripogenus Hydroelectric Project and

Penobscot Mills Hydroelectric Project

Great Lakes Hydro America, LLC

Project Nos: 2572-133, 2458-247

SCOPING SESSION - TELECONFERENCE

Thursday, September 9, 2021

The Virtual Scoping Meeting, pursuant to notice, convened at 6:30 p.m.

P R O C E E D I N G S

OPERATOR: Welcome, and thank you for standing by. All participants will be able to listen-only.

I would now like to turn your conference over to Mr. Allan Creamer. Sir, you may begin.

MR. CREAMER: Thank you very much.

I apologize for this delay here, we've had some technical difficulties getting going this morning.

Welcome, everyone to the Federal Energy Regulatory Commission's Virtual Scoping Meeting for the relicensing of the Ripogenus Hydroelectric Project, No. 2572, and the Penobscot Mills Hydroelectric Project, No. 2458.

My name is Allan Creamer, and I work in the Office of Energy Projects, Division of Hydropower Licensing at FERC, and I am the project coordinator for these proceedings. Several other FERC staff are joining me today, along with representatives of Great Lakes Hydro America and Brookfield Renewable, will listen to you as you provide comments during our scoping session.

The purpose of scoping is to seek input on the specific concerns or environmental issues related to relicensing the projects and to identify alternatives that should be considered in our environmental document.

I will begin by going over important meeting

notes, and will continue with a short introduction to the licensing process and schedule. Great Lakes Hydro America will then provide a short presentation on the projects and their operation.

Following Great Lakes Hydro America's presentation, we will begin taking your comments. As we all know, these virtual meetings are not routine for the Commission; it is in fact the first instance for hydro licensing. I thank everyone now for your patience while others are being heard.

As a point of clarification, there will be no summary at the end of our meeting. You are finished after providing comments; you will be disconnected from the call.

For those of you wishing to speak, we have a court reporter in each of our virtual breakout rooms to transcribe this evening's meeting. This transcript will serve as part of the Commission's record in these proceedings. When prompted, we ask that you please state and spell your name clearly, and provide information on any affiliation or group for which you are speaking or commenting.

After Commission Staff's introduction to the licensing process and Great Lakes Hydro America's introduction to the project, you will be invited to breakout rooms in the order in which we received your call. Please

remain on hold until it is your turn to speak; at which time you will be provided with five minutes. At the end of your time the operator will disconnect you and will move to the next in line, based on the order in which you had called in.

During these meetings you cannot listen to other commenters, as is typical in scoping. I remind you that a transcript of the scoping meeting will be placed on the Commission's website in eLibrary.

In advance, advisors that organizes this call, tell the court reporter that there may be times that we have no callers, and that is to be expected. However, we will keep the call open for the general public the entire duration of the meeting.

If you prefer not to speak today, or wish to file comments for any other reason, or if you have technical difficulties during the call, you can file written comments with the Commission by October 9th, 2021. Instructions for filing written comments are on page 2, paragraph O of our August 10, 2021 notice. We encourage you to eFile your written comments.

For those of you who wish to be on the FERC mailing list, official mailing list, please see the instructions on page 34 of our Scoping Document 1, also issued on August 10th, 2021.

Finally, we recommend that you go to FERC's

website, at www.ferc.gov and eSubscribe to the project using Project Nos. P-2572 and/or P-2458, which are the project numbers for the Ripogenus Project, 2572, and the Penobscot Mills Project, 2458. Doing this will ensure that you are notified of any filings with the Commission or of any issuances by the Commission related to these projects.

I'll now switch gears and introduce the licensing process and our schedule, and we'll then turn it over to Great Lakes Hydro for its introduction to the projects.

Great Lakes Hydro America has chosen to relicense the Ripogenus and Penobscot Mills Projects using the Integrated Licensing Process, or ILP. The ILP is the Commission's default licensing process. The process is driven by a process plan with defined timelines and deadlines for all participants, including Commission staff. The first step in the process is development of a Preliminary Application Document which is prepared by the applicant after gathering information from resource agencies and other sources.

The process is marked by early scoping as well as study plan development and resolution of any study disagreements. Specific criteria are used to develop focus and appropriate studies, and a Commission-approved study plan is developed in consultation with the stakeholders. The specific criteria are presented in Appendix A of Scoping

Document 1.

There are two years for studies, so there is an opportunity to reduce study results and make adjustments to the study plan based on specific criteria. Towards the end of the prefiling process, the applicant is required to develop a preliminary licensing proposal, or draft license application that includes a proposal for relicensing the project.

The process is designed to integrate stakeholder processes such as the Commission's licensing process, the Maine Department of Environmental Protection's water quality certification process, consultation under the Endangered Species Act, and the Federal agencies Section 18 process. Thereby improving the overall efficiency of the licensing process.

So where are we in the relicensing process for Ripogenus and Penobscot Mills? The relicensing process begins with an applicant filing a Notice of Intent and a Preliminary Application Document. Great Lakes Hydro America filed these documents on June 11, 2021. Commission Staff issued its Scoping Document 1 for the projects, and the Commission issued a public notice to proceed on August 10th, 2021.

Commission Staff is holding virtual public scoping meetings, and Great Lakes Hydro America conducted a

virtual environmental site review of the project today, September 9th, 2021.

Stakeholders then have an opportunity to file comments on Scoping Document 1 and the Preliminary Application Document as well as file study requests by October 9th, 2021. Once the comment period ends, Great Lakes Hydro America will prepare a proposed study plan which is due by November 23rd, 2021. There will be a meeting to discuss the proposed study plan on or around December 23rd, 2021. This represents an informal opportunity to resolve disagreements with the studies.

Comments on the proposed study plan are due by February 21st, 2022. After which Great Lakes Hydro America will file a revised study plan. The Commission will issue a study plan determination by April 22nd, 2022.

If necessary, there is a formal dispute resolution process that follows issuance of the study plan determination. The ILP process provides for two years of studies, which for these projects occur in 2022 and 2023. Great Lakes Hydro America will file an initial study report by April 21st, 2023 and a final study report by April 21st, 2024. Meetings will be held for each report. Great Lakes Hydro America will then file a Preliminary Licensing Proposal, or PLP, by May 3rd, 2024. Stakeholder comments on the PLP are due by August 1st, 2024.

The prefiling part of the process, Great Lakes Hydro America filing license applications for the two projects by September 30th, 2024.

I know I've gone through a lot of information in a short period of time. What I presented was intended to be an overview of the process schedule. The details can be found in Appendix D of Scoping Document 1.

Also, as you can see, this is a fast process, especially in the first eight to ten months, and it is a process to provide for stakeholder involvement.

At this point I'm going to turn the meeting over to a representative of Great Lakes Hydro America for an introduction to the projects and their operations.

MR. DORMAN: Thank you, Allan. Good morning, everyone. Thank you for dialing in tonight. My name is Randall Dorman, I'm the Licensing Manager for GLAJ, and I'll be managing the relicensing of the two West Branch projects, Penobscot Mills and Ripogenus license project.

I'm going to provide a very brief overview of these two projects; but it's worth noting that they are very large and they're very complex; and so it's going to be hard to convey all of the relationships between these components over the phone.

And so I'd strongly urge anyone who hasn't had the opportunity to take a look at our Pre-Application

document. Allan alluded to this in his introduction as something we had filed back on June 11th. It's available on FERC's website.

And what this document does, it gives an overview of our project facilities, our project operations, and it summarizes everything we could find on resources associated with the projects. So anything affected by this project is summarized in that Pre-Application Document.

We tried very hard to provide as clear and thorough a description of our project facilities and operation. I'm hoping that when you get a chance to take a look at it, it's a helpful guide for you.

So with that said, on to the description of the project. These facilities are licensed under two separate FERC licenses. We have Ripogenus, which is licensed as Project 2572; and then we have Penobscot Mills, which is licensed as Project 2458. And although they're separate licenses, we will file separate license applications for them, they both have the same expiration date; they are right above each other on the West Branch. And so we elected to relicense them essentially as a single unit in order to pick up some efficiencies and reduce paperwork, and the amount of meetings. So that's why we had chosen to do this the way we have.

So what I will do now, I'm just going to walk

through a very high level overview of the projects. I'm going to start at the top of our system, I'm going to work down through the facilities. So we'll start with the Ripogenus Project, and we have one kind of interesting development, Umbazookssus, which is -- it's part of the project. It is a wetlands mitigation project that came out of the last license. But it's not a functioning, working reservoir. So we aren't manipulating flows up there to affect the project; the water is just flowing out of that, naturally run-of-river. Because like I said, it's a run-of-river mitigation project that we have established.

But water runs down from Umbazooksus into the Ripogenus impoundment, and the Ripogenus impoundment has several sub bases within it that are part of that larger impoundment. So you have Ripogenus Lake, you have Caribou Lake, Chesuncook Lake, you have Moose Pond, Brandy Pond and Black Pond -- all of these are part of that Ripogenus impoundment which is created by the Ripogenus Dam.

There's no generating facility at the dam itself. Water is diverted down to McKay station, which is the generator station associated with Ripogenus. So McKay is a 37.5 megawatt generating facility. Water goes into McKay, discharges back into the West Branch, and then, that is largely the end of the project features associated with the Ripogenus. What you saw was the footprint of it. You look

at the size of it, it's pretty enormous. We've got almost 30,000 acres of impoundment.

But it's primarily those two facilities; Ripogenus Dam and McKay station. There is a very long transmission line that is part of the project, but in terms of river -- really we don't go much below the station as part of rivertine.

So that's it for that project. And now I'll talk a little bit about the Penobscot Mills Project, which is much more complicated because it has many more moving parts, so to speak. I'll start at the top of the Penobscot Project with the North Twin impoundment, and again the North Twin impoundment, Ripogenus is composed of separate sub-base that are a part of that.

So North Twin, Elbow Lake, North Twin Lake, South Twin Lake, Pemadumcook Lake, and Ambajesus Lake. So water from McKay comes down the West Branch, reaches North Twin impoundment.

We also have, as part of this system, Millinocket which we can pump water from into North Twin when we need to augment flow. From North Twin, water then goes to North Twin generating station; that's a 6.9 megawatt facility. Water from North Twin casts down into Millinocket Lake; and then Millinocket, Quakish Lake and Ferguson Pond.

At Millinocket Lake we currently have two

components there. We have Stone Dam and when we have Millinocket station. So most of the water is diverted via Stone Dam to Millinocket station. That's a 37.4 megawatt station.

From Millinocket it discharges back downstream, enters Chaz Pond, which is actually outside the project boundary. Chaz Pond, the water travels to Dolby impoundment, and from Dolby the water runs through Dolby station; that's a 16.5 megawatt station. Passes from Dolby back into the West Branch, follows the river down to the East Millinocket impoundment. This is our smallest impoundment in the system.

And then from East Millinocket it goes to East Millinocket station, which is a 7 megawatt station; and then from there it goes back into the West Branch, and that's the bottom of our project.

There are some very helpful things, some maps, high level maps of these projects from that PAD, as well as this very handy diagram. I'm not going to kid you, I'm looking at the diagram as I'm going through the description of the facilities. It very clearly lays out where the water is going; it also has specific details on how much water and when some of these operating requirements we have are in place.

So again, my pitch for the Pre-Application

Document here, because I just really think it will be a useful reference document for you to look at.

And with that, Allan, I think that concludes my overview of the projects here.

MR. CREAMER: Okay, thank you, Randy.

I think, Julie, we are ready to begin our comments.

OPERATOR: Thank you. One moment.

VOICE: ..via FERC.gov or by mail. Written comments are given equal consideration...

OPERATOR: We'll go ahead and place you in your breakout room. Just to confirm, where should Speed go?

MR. CREAMER: Place them in Breakout Room 1.

OPERATOR: Room 1, okay. That's good.

All right. You're moving now.

MR. CREAMER: Thank you.

(Pause)

MR. CREAMER: Hello.

VOICE: Hey, Allan.

VOICE: Who do we have in this breakout room?

VOICE: This is Steven.

VOICE: So just us?

VOICE: Welcome, and thank you for participating. You are now in the room so that you make your comment to the court reporter. You will have five minutes to speak. I

will give you a warning when you have 30 seconds remaining. Please state, tell your name for the record and whether you're speaking on behalf of a group or an affiliation.

And you may begin your comment.

VOICE: Hey, Allan?

MR. CREAMER: Yes.

VOICE: I think I heard -- that may have been tape coming in. Did you hear that?

VOICE: Oh, this is Cate Russel at HDR. I've been --

MR. CREAMER: Oh, you are here. Okay. All right.

(Pause)

VOICE: Hello and thank you for participating. You are now in the room to provide your comment to the court reporter. You will have five minutes to speak. I will give you a warning when you have 30 seconds remaining. Please state and spell your name for the record and whether you're speaking on behalf of a group or an affiliation.

MR. OUELLETE: Yes, my name is Richard R R-i-c-h-a-r-d O-u-e-l-l-e-e-t-e. And I am the President of the [static] Association on South Twin Lake. We have roughly 200 members on the Lake, and we are very pleased with the operation that Brookfield has been providing over the years.

They have maintained a water level at recreational levels very well. We haven't had any issues where we've had major flow increases or decreases, especially this year with the drought conditions that we've had. I feel that they have done an excellent job of maintaining water flow for both the rafting people on the West Branch as well as the camp owners and homeowners on South Twin Lake.

The number of camps on the lake has grown over the years, and we have been there for roughly 24 years; and within the last 5 years a number of instances of camps being turned over and replaced by yearly residents.

So we feel that it's stewardship of the fields, that they have done an excellent job, and we would be happy to have their license renewed for the, whatever number of years; I'm not sure if it's ten years or twenty years or what have you.

That's my comment.

MR. CREAMER: Thank you for your comment.

VOICE: Thank you. We will include your comments in the public record for this project and they will be entered into consideration for the project.

You may now --.

One moment.

(Pause)

VOICE: Hello and thank you for participating.

You are now in the room to provide comment to the court reporter. You will have five minutes to speak. I will give you a warning when you have 30 seconds remaining. Please state your name and spell it for the record, and whether you're speaking on behalf of a group or affiliation.

MR. FORTI: Okay, good evening, everybody. My name is Peter Forti, F-o-r-t-i. I am a local landowner up on Tarifee Lake, Lake Caribou, and I was listening to this morning's presentation, and all I heard was the thought of, "Well, we don't know. You'll have to find out about this; we're missing documents" and then it shifted to water flows. Which doesn't really address any of these issues.

One thing I would like to address, and I'm going to make this short and sweet -- is the water levels north of your dam. You go up to Lake Caribou right now, it looks like a testing site for NASA for future Mars programs. It's a barren lake, there's nothing in there. And as a landowner for so many years, I've seen progressively the water levels continue to drop year after year after year. And as a taxpayer, I get my taxes raised every year, and my water levels get reduced.

So it's not fair to the recreational people that have places north of Rip Dam and use the upper lake for recreational purposes. So I just ask the Board to consider, when they're going through this to do something

about maintaining the water levels at least on Lake Caribou. All right? There's no reason why that lake has to be a barren pit.

That's all I have to say.

VOICE: Thank you for your comment. We will include your comments in the public record for this project and they will take -- in the review of the project.

You may now --

MR. FORTI: Thank you.

VOICE: Please stand by for the next speaker.

Hello, and thank you for participating. You are now in the room to provide your comments to the court reporter. You will have five minutes to speak. I will give you a warning when you have 30 seconds remaining. Please state, tell your name for the record and whether you're speaking on behalf of a group or an affiliation.

And you may begin your comment.

(Pause)

VOICE: Hello, and thank you for participating. You are now in the room to provide your comments to the court reporter. You will have five minutes to speak. I will give you a warning when you have 30 seconds remaining. Please state and spell your name for the record and whether you're speaking on behalf of a group or affiliation.

You may begin.

MS. SCHMIDT: Katheryn Schmidt. I am a resident of the Penobscot River watershed. I am here to speak on behalf of, we run Atlantic salmon and other fish. The Ripogenus and Penobscot Mills project should not be relicensed unless they provide upstream and downstream passage for fish that migrate between the West Branch Penobscot River and the ocean.

Historical records tell us that sea run salmon came all the way up the West Branch, past Chesuncook and Spednic Lake, into the North and South Branches of the Penobscot River. There was a time on the West Branch with excellent salmon habit.

According to fisheries biologist Charles Atkins, writing in 1874, quote: Of the tributaries in this part of the Penobscot, the Millinocket, Nanacasa, Oagna, Caribou and Cocomgama Stream are particularly well-suited to be the breeding grounds for salmon. End quote.

In 1866, Edward G. Masterman of Greenville told Charles Atkins that quote: In August and September of any year, he can catch young salmon from 6 to 12 inches long at Ripogenus Falls. And Joel Lane reported that one night in November 1838 he speared nine large salmon on Ripogenus Falls. Joe Francis, Maine Fish Commissioner Charles Atkins made of Penobscot -- saw them in Penobscot Brook, the headwaters of the West Branch.

The removal of West Branch from Atlatic Salmon habitat began during the 19th Century when loggers transformed the landscape in order to move trees to the downstream sawmill. By the middle of the 20th Century, pollution from paper mills on the West Branch prevented any salmon that survived from getting past the dam, whether built for log driving, holding loss for generations.

As they disappeared from the river, fish habitat and map salmon restoration. It is not clear why this, but the result has been that, for more than a century, the West Branch is sacrificed for electricity generation that is not as necessary nor as renewable as it was once believed to be. The costs are too great. Salmon are on the endangered species list and we, all of us -- not just the Penobscot Nation or NOAA, or U.S. Fish and Wildlife Service, are obligated to prevent their extinction.

Right now these dams are preventing recovery of Atlantic salmon, and it is time the West Bank be included in restoration efforts. Otherwise, we can continue to violate the return of the species.

I hope that effective fish passage be required as part of the studies in consideration for these relicensings. Thank you for the opportunity to comment.

VOICE: Thank you for your comment. We will include your comments in the public record for this project

and they will be considered in the review of the project.

You may now end the call.

MS. SCHMIDT: Thank you.

(Pause)

VOICE: Hello and thank you for participating. You are now in the room to provide your comments to the court reporter. You will have five minutes to speak. I will give you a warning when you have 30 seconds remaining. Please state and spell your name for the record and whether you are speaking on behalf of a group or affiliation.

And you may begin.

VOICE: Is there somebody there?

VOICE: Yes. I was just hoping to kind of listen if I called.

VOICE: If you don't have any comments to make, I don't think that that's what we were planning to do. I mean, people are moved into the room to provide comments, and that's it.

VOICE: Oh, okay. I didn't have any comments necessarily prepared.

VOICE: That's fine. If there are any comments that you would like to make, you can have time to do that, five minutes. Actually less than that now.

VOICE: Yeah, I don't have any. I'll send something in writing. Okay. Thank you.

(Pause)

VOICE: Hello and thank you for participating. You are now in the room to provide your comments to the court reporter. You will have five minutes to speak. I will give you a warning when you have 30 seconds remaining. Please state and spell your name for the record and whether you are speaking on behalf of a group or affiliation.

And you may begin.

MS. RUSSEL: This is Cate Russel. Allan, are you still on?

MR. CREAMER: Yes, I'm here.

MS. RUSSEL: Okay. I just wanted to make sure my line didn't go dead.

(Pause)

VOICE: How many people were here and what kind of participation?

MR. CREAMER: You know what? I'm not really sure if -- I was just thinking about that myself, whether I can ask Julie how many people we had total that were transferred over at the end. I mean, she was managing all of the name transfers, as I understand it.

What's that?

VOICE: We had a good turnout this time.

MR. CREAMER: Yes.

(Pause)

VOICE: ...sounds like they have three comments on the other line as well.

(Pause)

VOICE: This is the conferencing operator. I wanted to let you know that right now we don't have anyone queued up for comment at this time. So we stand by.

MR. CREAMER: Okay. Thank you.

(Pause)

VOICE: Hello and thank you for participating. You are now in the room to provide your comments to the court reporter. You will have five minutes to speak. I will give you a warning when you have 30 seconds remaining. Please state and spell your name for the record and whether you are speaking on behalf of a group or affiliation. Then begin your comment.

And the caller has disconnected.

(Pause)

[Staff chatter]

MR. CREAMER: Well, it's interesting, because our Verizon person was in a different place, with a voice over last time, when we thought we had somebody on.

I was thinking to myself, "Huh, can we combine rooms already?"

VOICE: That's -- yes, I was wondering.

MR. CREAMER: Because I was wondering if that's

possible.

OPERATOR: Excuse me, this is the operator, by the way. I just took over for a short time while A was on break.

MR. CREAMER: Okay.

OPERATOR: So sorry about that, guys.

(Long Pause)

VOICE: Hello and thank you for participating. You are now in the room to provide your comments to the court reporter. You will have five minutes to speak. I will give you a warning when you have 30 seconds remaining. Please state and spell your name for the record and whether you are speaking on behalf of a group or affiliation.

And you may begin.

MS. HOPPER: My name is Siona S-i-o-n-a Hopper, -p-e-r, and I am speaking on behalf of myself, though I do work for the Portland Public Schools. And in my role at the Portland Public Schools, I am the District Wabanake studies coordinator, and I have had the great fortune of working with many Penobscot people as well as meeting leaders from other Wabanake tribes. And I am not a natve person, but I have been increasing my own education and understanding of impacts of dams on rivers.

I live in the watershed of the Penobscot River which, like many rivers including the West Branch of the

Penobscot, has been really devastated by daming, and many other severe impacts to the ecosystem.

And so I am speakng in hopes that the West Branch of the Penobscot River will have dams removed and the stewardship of that river will be returned to the Penobscot Nation. I really hope that there have been many people speaking on behalf of the river tonight. It is critical for the Penobscot Nation and of course everybody who lives in the land. It is a huge watershed and a vibrant ecosysem, and all of us have a responsibility to ensure that that ecosystem can regenerated and passed on for generations.

As far as the economics of it go, I don't pretend to be an expert in that area, but we know that that whole entire region is a destination for wildlife and and wilderness lovers, and I would imagine that there's a huge opportunity with the restoration of the ecosystem of the West Branch, usher in positives, go tourism related to development hopefullly led by local communities and by the Penobscot Nation.

And I would also just say as an educator and a teacher that having ecosystems intact so that students can learn direct from the watersheds around them is critically important and also part of students learning to be responsible for the places in which they live.

So I would urge FERC to make sure that they're

taking all of the information that has been presented by those who came from the Penobscot Nation, take all of that into consideration, and think about the long term impacts of potential inaction and make the right decision to decommission and remove all of the dams in the West Branch. Thank you.

VOICE: Thank you for your comment. We will put your comments in the public records for this project, and they will be considered and be reviewed by the project team.

You may end the call.

MS. HOPPER: Thank you very much.

(Pause)

[Staff chatter]

[Whereupon, at approximately 8:30 p.m., the comment session concluded.]

CERTIFICATE OF OFFICIAL REPORTER

This is to certify that the attached proceeding before the FEDERAL ENERGY REGULATORY COMMISSION in the Matter of:

Name of Proceeding:

Ripogenus Hydroelectric Project and

Penobscot Mills Hydroelectric Project

Great Lakes Hydro America, LLC

Docket No.: Project Nos: 2572-133, 2458-247

Place: Virtual

Date: Thursday, September 9, 2021

were held as herein appears, and that this is the original transcript thereof for the file of the Federal Energy Regulatory Commission, and is a full correct transcription of the proceedings.

DAN HAWKINS

Official Reporter

UNITED STATES OF AMERICA

FEDERAL ENERGY REGULATORY COMMISSION

Office of Energy Projects

Virtual Scoping Meeting

Ripogenus Hydroelectric Project, Project Nos. 2572-133
Penobscot Mills Hydroelectric Project, 2458 -- Maine
- - - - - - - - - - - - - - - - - - - x
Great Lakes Hydro America, LLC
Brookfield Renewable
- - - - - - - - - - - - - - - - - - - -x

SCOPING SESSION - TELECONFERENCE

Thursday, September 9, 2021

The Virtual Scoping Meeting, pursuant to notice, convened at 9:00 a.m.

P R O C E E D I N G S

OPERATOR: Welcome, and thank you for standing by. All participants will be able to listen-only until the question and answer portion of today's conference. At that time you may press *1 on your phone to ask a question.

I would now like to turn your conference over to Mr. Allan Creamer. Sir, you may begin.

MR. CREAMER: Thank you. Welcome, everyone to the Federal Energy Regulatory Commission's Virtual Scoping Meeting for the relicensing of the Ripogenus Hydroelectric Project, No. 2572, and the Penobscot Mills Hydroelectric Project, No. 2458.

My name is Allan Creamer, and I work in the Office of Energy Projects, Division of Hydropower Licensing at FERC, and I am the project coordinator for these proceedings. Several other FERC staff are joining me today, along with representatives of Great Lakes Hydro America and Brookfield Renewable, will listen to you as you provide comments during the scoping process.

The purpose of scoping is to seek input on the specific concerns or environmental issues related to relicensing the projects and to identify alternatives that should be considered in our environmental document.

I will begin by going over important meeting notes, and will continue with a short introduction to the

licensing process and schedule. Great Lakes Hydro America will then provide a short presentation on the projects and their operation.

Following Great Lakes Hydro America's presentation, we will begin taking your comments. As we all know, these virtual meetings are not routine for the Commission; in fact, it's the first instance for hydro licensing. I thank everyone now for your patience while others are being heard.

For those wishing to speak, we have a court reporter to transcribe today's meeting. This transcript will serve as part of the Commission's record in these proceedings. When prompted, we ask that you please state and spell your name clearly, and provide information on any affiliation or group to which you are speaking before beginning your comments.

After Commission Staff introduction to the licensing process and Great Lakes Hydro America's introduction to the project, you will be invited to speak in the order we received your call. With the setup for this meeting, we will all listen together as comments are presented by each of you. Please follow directions from our Verizon operator during this time to provide comments.

Nearing the end of your allotted time, the operator will prompt you to finish, and will then move to

the next in line. After providing the comments, you can remain on the line, and we will finish the meeting with a Q&A session.

If you prefer not to speak today, or wish to file comments for any other reason, you can file written comments with the Commission by October 9th, 2021. Instructions for filing written comments are on page 2, paragraph O of our August 10, 2021 notice. We encourage you to eFile your written comments.

For those of you who wish to be on the FERC mailing list, official mailing list, please see the instructions on page 34 of our Scoping Document 1, also issued on August 10th, 2021.

Finally, we recommend that you go to FERC's website, at www.ferc.gov and eSubscribe to the project using Project Nos. P-2572 and/or P-2458, which are the project numbers to the Ripogenus Project, 2572, and the Penobscot Mills Project, 2458. Doing this will ensure that you are notified of any filings with the Commission or any issuances by the Commission related to these projects.

I'll now switch gears and introduce the licensing process and our schedule, and we'll then turn it over to Great Lakes Hydro for its introduction to the projects.

Great Lakes Hydro America has chosen to relicense the Ripogenus and Penobscot Mills Projects using the

Integrated Licensing Process, or ILP. The ILP is the Commission's default licensing process. The process is driven by a process plan with defined timelines and deadlines for all participants, including Commission Staff. The first step in the process is development of a Pre-Application Document which is prepared by the applicant after gathering information from resource agencies and other sources.

The process is marked by early scoping as well as study plan development and resolution of any study disagreements. Specific criteria are used to develop focus and appropriate studies, and a Commission-approved study plan is developed in consultation with the stakeholders. The study criteria are presented in Appendix A of Scoping Document 1.

There are two years for studies, so there is an opportunity to reduce study results and make adjustments to the study plan based on specific criteria. Towards the end of the prefiling process, the applicant is required to develop a preliminary licensing proposal, or draft license application that includes a proposal for relicensing the project.

Process is also designed to integrate stakeholder process with respect to the Commission's licensing process, the Maine Department of Environmental Protection's water

quality certification process, consultation under the Endangered Species Act, and the Federal agencies fishways process. Thereby improving the overall efficiency of the licensing process.

So where are we in the relicensing process for Ripogenus and Penobscot Mills? The relicensing process begins with an applicant filing a Notice of Intent and a Preliminary Application Document. Great Lakes Hydro America filed these documents on June 11, 2021. Commission Staff issued its Scoping Document 1 for the projects, and the Commission issued a public notice of the proceeding on August 10th, 2021.

Commission Staff is holding virtual public scoping meetings including Great Lakes Hydro America's virtual environmental site review of the project today, September 9th, 2021.

Stakeholders then have an opportunity to file comments on Scoping Document 1 and the Pre-Application Document as well as file study requests by October 9th, 2021. Once the comment period ends, Great Lakes Hydro America will prepare a proposed study plan which is due by November 23rd, 2021. There will be a meeting to discuss the study plan on or around November 23rd, 2021. This represents an informal opportunity to resolve disagreements with the studies.

Comments on the proposed study plan are due by February 21st, 2022. After which Great Lakes Hydro America will file a revised study plan, and the Commission will issue a study plan determination by April 22nd, 2022.

If necessary, there is a formal dispute resolution process that follows issuance of the study plan determination. The ILP process provides for two years of studies, which for these projects occurs in 2022 and 2023. Great Lakes Hydro America will file an initial study report by April 21st, 2023 and a final study report by April 21st, 2024. Meetings will be held for each report. Great Lakes Hydro America will then file a Preliminary Licensing Proposal, or PLP, by May 3rd, 2024. Stakeholder comments on the PLP are due by August 1st, 2024.

The prefiling part of the process, the Great Lakes Hydro America filing license applications for the two projects by September 30th, 2024.

I know I've gone through a lot of information. what I presented was intended to be an overview of the process. Details can be found in Appendix D of Scoping Document 1.

Also, as you can see, this is a fast track process; actually in the first eight to ten months, and it is a process to provide for stakeholder involvement throughout.

At this point I'm going to turn the meeting over to Randy Dorman of Great Lakes Hydro America, talking about this project and their operations.

MR. DORMAN: Thank you, Allan. Good morning, everyone. I'm Randall Dorman, I'm Licensing Manager for Great Lakes Hydro, and I'll be managing the relicensing of the West Branch relicensing. This is going to include Penobscot Mills and Ripogenus.

As Allan said, I'm going to be giving a very brief overview of these projects; but really these are very large and very complex facilities; there are multiple types. And so I'd really urge anyone who hasn't already to take a look at our Pre-Application document. You can find that on the FERC website.

We tried very hard to prepare a fair and thorough discussion of our project facilities and operations. In addition to that we are also going to be holding a virtual site review this afternoon at 1:30. And we are going to have some video and PowerPoint, I think, to better illustrate these projects. So if you wish to sign up and you haven't done so already, you can send an e-mail to Cate Russel at HDR, Inc.com. And that's Cate with a C. Cate.Russell@HDRInc.com. That's to sign up for the virtual site review at 1:30 this afternoon.

So on to the project. These facilities are

licensed under two separate FERC licenses. We have Ripogenus, Project 2572, and then Penobscot Mills, which is Project 2458. Although they're separate, they have the same expiration dates and we elected to relicense them essentially as a single unit just in order to gain some efficiencies, cut down on paperwork, and the number of meetings. So that's why we're proceeding this way.

So let me do just a very quick walk-through over these projects. I'll start at the top of the system with Ripogenus. And we have Umbazookssus, which is a reservoir that flows into the Ripogenus impoundment, and the Ripogenus impoundment actually consists of several smaller bodies of water; so that's Ripogenus Lake, Caribou Lake, Chesuncook, Moose Pond, Brandy Pond, Black Pond -- those are all within Ripogenus, and there's no generating facility at the dam itself. Water is passed from the dam down to the McKay (ph) station; the generating of Ripogenus -- that's a 37.5 megawatt station.

McKay discharges into the left branch, and that, all of the Ripogenus facilities talking about, these are all associated with the Penobscot Mills, which actually has quite a few more components to it.

So we'll start the overview of Penobscot Mills with the north impoundment, which like Ripogenus consists of several smaller bodies of water; so we've got Elbow Lake,

North Twin Lake, South Twin Lake, Pemadumcook Lake, Ambajesus Lake.

Water comes into North Twin from the West Bank below a station, or Millinot, which is also part of Penobscot Prospect. So from North Twin the water at North Twin Station, that's a 5.9 megawatt station; and then discharges from there down to Millinocket impoundment. That includes two water bodies, Quakish Lake and Ferguson Pond. That in turn flows to Millinocket Lake, that's a 37.4 megawatt station.

That again, below that is Shad Pond, which is not actually in the project boundary, but continues down from Shad Pond to the Dolby Impoundment and Dolby Station. Dolby Station is 15.5 megawatts. That in turn goes back into West Branch to the East Millinocket station with 7 megawatts, and then that goes back into West Branch, and that is the lowermost facility that we'll be talking about today.

Allan, I think that's it for my overview of the project.

MR. CREAMER: Okay, thank you, Randy.

At this point I would ask if there were any specific questions with regard to what we've covered on the licensing process schedule and the facilities.

So Julie, if you want to go to the lines for that.

OPERATOR: Thank you. If you would like to ask a question or make a comment, please press star-one. You will be prompted to record your first and your last name with affiliation. To withdraw your question, press star-two.

And once again, to ask a question, make a comment, it is star-one. One moment, please.

We do have a question or comment. One moment.

Our first question or comment comes from Casey Clark, with NBMR.

Your line is open.

MR. CLARK: Thank you. My question was just about the scope of the project. You said it was complex; I was wondering if either FERC or Great Lakes Hydro intends to have it for a longer process, licensing. That's the end of my question.

MR. CREAMER: Thank you. This is Allan Creamer with FERC. The process is designed, they have to file their application by November 30, 2024. They've got a defined timeline to get to that point, and they're up to that point.

After that, we will process the application according to the timelines that we will post when the applications are filed, and typically we do try to issue new licenses within two years before the expiration. Doesn't always happen that way, but that's what our goal is.

So I think along the way, the path of trying to

complete these in the time frame that the ILC provides for. At this point we're not expecting to do anything beyond that time frame.

OPERATOR: Once again, to ask or make a comment, it is star-one. Our next question/comment comes from Jeff Murphy with National Marine Fisheries Service.

MR. MURPHY: Hi. Can you all hear me?

MR. CREAMER: Yes.

MR. MURPHY: Oh, great. Thank you.

First, I would echo concerns that given the complexity of the projects, it's going to be extremely difficult, perhaps even impossible to navigate all these issues in two years. So I would urge the Commission to consider those concerns.

But my question is, when these projects were first constructed, power was exclusively for the people, you know, of the Millinocket market regions. And the power, even by state law, had to be used exclusively for paper production.

So I suspect that when the Great North Paper Company owned and operated these projects, they were operated very differently than they are today. So I think it would be helpful for everyone on the call if Great Lakes Hydro could explain to folks how these projects were first used and operated, to today when they are used for ISO New

England; and how those operations they have changed over the past, those many years. Thank you.

MR. DORMAN: Is Mike Osborne -- he is our water management operations person. And if he's on, Jeff, I think he'd be in the best position maybe to talk at very high level in the time we have about this.

If not, I think we would probably want to hope, that's something we could potentially talk about during the site review this afternoon.

OPERATOR: Mr. Osborne, if you are on, please press star-zero. Once again, Mr. Osborne, if you are on, please press star-zero.

One moment. He has signaled.

MR. OSBORNE: Hello. Can everybody hear me?

MR. DORMAN: Yes.

MR. CREAMER: Yes, we can hear.

MR. OSBORNE: So essentially the paper mill, after hard times, economic downturn, multiple ownership changes and what not, the East Millinocket mill went down in 2013, the Millinocket mill went down in 2008. However, there are ongoing economic development efforts with the towns of Millinocket, East Millinocket, other nonprofit entities and how other stakeholders to try and bring businesses back to those mill sites and utilize some of this hydropower to support that.

MR. MURPHY: Thank you.

OPERATOR: Once again, to ask a question or make a comment, it is star-one. One moment, please.

(Pause)

OPERATOR: We do have another question or comment. One moment. A. Murphy with National Marine Fisheries Service.

MR. MURPHY: Hi. Can you hear me again?

MR. CREAMER: Yes.

MR. MURPHY: I promise not to take over these calls.

For the record, National Marine Fisheries Service will be submitting formal comments on the application documents, and will file a study request.

But could you start with the PAD itself, and some of the assumptions in the PAD? I note that there are few if any proposed studies in the document, the ecological additions that are in the project areas. And from my perspective, primarily fisheries, that Great Lakes Hydro is proposing to update with the fisheries resources areas. The fisheries resources, the project areas.

Forty years ago, I know the extent and the effort that we engaged in in documenting the fisheries resources in areas, and I think that what the licensee is assuming is that in particular fisheries resources are the same as they

are today, and that's true.

You may recall in the previous license, fishways weren't installed because certain species, in particular small mouth bass, but we know today that small mouth bass are the dominant fishery than the fish that has invaded, probably non-native, maybe even in the Upper Wash area.

I believe that the project is operated differently than it was in the Eighties when all the power was consumed by paper production; and there was more or less a constant demand for power. And what we're seeing today is peak, peak in operation of these stations, twins.

I think if we continue down this path that the fisheries resources today are the same as they were in the Eighties, it will be fundamentally flawed because fisheries resources are significantly different. And not only fisheries, but most environmental resources are different today than they were in the Eighties.

So I would suggest, given that the only have, perhaps even just two years to gather this information, that the licensee should immediately start re-documenting the environmental baseline position for all environmental resources, in particularly fisheries resources in the project area.

I know that the Great Northern Company did a number of mark and recapture, age and grow populations,

spawning survey. All those studies have to be repeated because the conditions today are not the same conditions that they were in the Eighties. The condition under NEPA analysis, assuming conditions today are the same as they were in the Eighties, that they will be fundamentally different from the onset.

So again, my recommendation is that the licensee, even this fall, start to re-document things like fisheries resources in the project area. Thank you.

MR. CREAMER: Thank you, Jeff.

OPERATOR: Our next question-comment comes from Robert Nesbur. Your line is open. With American Whitewater.

MR. NESBUR: Thank you. I have a couple of questions or comments on this section.

First, the PAD always deals with the battery storage component here. Are we going to be addressing that issue today as well? And I'd like some clarification on how the battery storage is used. Is that just for environmental mitigation? Or to take advantage of spot markets or other peaking opportunities? That's my first question.

JIM: Randy, this is Jim. I'd be happy to take that question if it's helpful.

MR. DORMAN: Go for it, Jim.

JIM: So Bob, the battery -- and this is addressed in the PAD and we'll talk about this tomorrow at

1:30. But the two battery disburse facilities that have been established, they are not a mitigation measure, and they change no aspect of project operation.

What they do, as compared to peaking, what they do is they provide grid stability for ISO New England. So as ISO New England needs grid stability in this part of the state, the battery systems that we're dispensing help support that effort.

MR. NESBUR: That's helpful, thank you.

The second question is, the PAD describes different developments that are either peaking or run-of-river. And I guess I'm a little confused by that.

Would it be accurate to say that being both projects are, both Ripogenus and Penobscot Mills, are both influenced, the flows are influenced by the peaking operation at Ripogenus, so that all of the Penobscot Mills project, generate based on the peaking inflows from Ripogenus?

JIM: Randy, I can touch upon that as well, if it's helpful. And once again, we kind of outline this in the PAD.

So I give our predecessors a lot of credit and foresight in terms of -- that this system, the Ripogenus impoundment, the North Twin impoundment, Millinocket Lake, working in conjunction with the upstream storage project,

and what those ponds collectively do is they provide that constant base flow down through the remainder of the West Branch; and then when the West Branch converges with the East Branch, and then further downstream.

So those base spawning flows, those base fishery flows, everything that we see downstream starting downstream of North Twin, that is coming from the fluctuation, the allowances that are allowed at Ripogenus, North Twin, and Millinocket Lake.

So Bob, to your question, those ponds are being used to manage really the larger watershed, and then you -- to your point, you do get into a series of run-of-river facilities at the Millinocket development, the Dolby development, the East Millinocket development -- which are the ones that Randy referred to earlier --and then we go further downstream to Medway, Madacina, West Enfield, and further downstream. Yes, those are all run-of-river facilities based on the ace flow being provided by the upstream facilities.

BOB: But I take it it wouldn't be accurate to describe it as a natural hit by the upstream fluctuation, correct?

JIM: That's exactly correct. Especially if you look like a year at, like today, this year. If that fluctuation flexibility did not exist, as we look further

down on the West Branch and then obviously on the main stem, you wouldn't have those flows that are established throughout the system.

So once again, those North Twin impoundment, Millinocket Lake and Ripogenus impoundment, they act as the, kind of the base water that feeds the rest of the system.

BOB: Thank you.

OPERATOR: Once again, if you would like to ask a question or make a comment, please press star-one.

One moment, please.

Our next question or comment comes from Chaz Murphy with National Marine Fisheries Service. Your line is open.

MR. MURPHY: Hi. Thanks again. I apologize for all my questions, but.

Just in response to Jim's statement, as I mentioned earlier, I believe the projects were significantly operated differently than they were in the Eighties, and particularly the operations at McKay station and North Twin that flow throughout the summer and into the fall, very high water, a magnitude of probably from, flows from 18 to 2800 at McKay station during the day. And you'll see similar operations at North Twin as peaking.

As I mentioned, actually very curiously the license to contrast operations, done only outflows at the

project; track daily outflows, days in the 1980s but also impoundment level. But in any event, given that we know the case is operated in run-of-river mode, and is North Twin, and the projects operate in tandem with North Twin. That while they are licensed as run-of-river facilities, their inflow equals outflow, they are in fact, in a sense, peaking themselves, as inflow on a daily basis causing a change from North Twin and McKay station.

So just want to make sure that's a correct, clear that while those lower projects may be licensed as run-of-river facilities, they are not, there's no -- it's not a steady state of outflows from those projects, so we need to be very clear about that; that that's how they are operated.

Thank you.

OPERATOR: Our next question or comment comes from Casey Clark with MPMR. Your line is open.

MR. CLARK: Yes, thank you. Also following up on that question about operations at the projects, and I noted that in the PAD in Section 5.3 you provide summaries, tables, river flows, as the project starts the year, and I was going to ask if you're intending to provide more detailed information, and that would be something along the lines of turbine operation or something else we can actually see river flow as a -- no, there's no USGS gauging or any other way for us to have an external way to review how

these projects are operated except for that one summary table, more data would be important.

JIM: I guess, this is Jim again -- I think that would be a logical conversation to have in the context of the study to be performed, provide such information. So yeah, I think if that comes in as a study request, it would be logical information at that time.

OPERATOR: Once again, to ask your question or make a comment, please press star-one.

One moment, please.

We do have another question or comment. One moment.

Our next question or comment comes from Julie Ann Rosset with U.S. Fish and Wildlife Service. Your line is open.

MS. ROSSET: Good morning, this is Julie Ann.

I just had a question to follow up on Casey's, I just want to make sure that I'm understanding. So there is no data related to the flows exiting these facilities that are available to the agencies? It's only Brookfield that is able to view that information?

Can you confirm that that's correct?

JIM: Randy, this is Jim. I think we have to talk with Mike or someone in terms of what data is readily available to others. Obviously, it kind of gets back to

Jeff's earlier comment.

There are the prescribed whitewater flows coming out of McKay station. There's obviously the 2000 cfs requirement. There's a number of flow requirements throughout the system. I think to Casey and Julie Ann's question, actual flows, we're going to have to check with just what's available and in what format it exists.

[MR. DORMAN:] I think that's correct, Jim. I think the executive summary probably is, in the absence of USGS gauges, the data is not readily available to agencies or the public, for that matter.

MS. RUSSET: Okay, thank you for clarifying.

OPERATOR: Our next question or comment comes from Casey Clark with MDMR. Your line is open.

MR. CLARK: Yes, sorry I need to comment on this, and then to clarify your response there, Jim.

I would see this as a data request, not as an actual study. I would ask you to estimate flows or really cleaning up the data and providing it so we have access to it; and I would expect that we really need that soon so that we can base our study requests upon it. Thank you.

OPERATOR: Once again, to ask a question or make a comment, please press star-one [*1].

If you have a question or comment. From Steven Hines of Trout, Unlimited. Your line is open.

MR. HINES: Yes. This kind of builds on the DMR and the National Marine and Fisheries Service comments. There is a lot of reference to prior studies that are, have aged out, and I guess, you know, when I think we're faced with is a process problem, because if we rely on, if we're going to rely on these studies, we need to know what's in them and most of these are so old, I don't have copies of them, and I don't know how to obtain copies of some of it.

So I guess what I would ask and propose is that there be a mechanism set up where if Brookfield is going to be using these studies, you know, as part of their license application, that we're given access to them and then at least 60 days to review them. You know, what we're going to be up against is -- you know, it's kind of like, kind of a "trust us, these studies are good" we may not be able to get access to them, and then when the deadline comes for submission of the study plans next month, you know where are we then?

I mean, I guess this is really a process question. I hope Mr. Creamer would address this.

MR. CREAMER: Okay, so at this point in time we're - we do need to look at what data is available and what the quality of that data is. And I guess that's -- I mean, that's where we are, and moving forward then we decide what data gaps need to be filled, and that becomes what the

study plan is.

So to the extent that there's, you know, the previous studies are out there, you know -- I know they're summarized in the PAD, but it probably would be helpful if those studies were available somewhere, whether they're in the record at the Commission on eLibrary, which is preferable. But I know we've talked about this before, the possibility of a relicensing website where things can be deposited and available for people to look at.

But it does make sense; I mean if you're looking at what studies need to be done, you need to know what's there now. And if the stakeholders don't have that opportunity to know what current studies say, that does become a bit of a problem.

MR. HINES: Well, thanks for acknowledging that, Allan. So what I'm asking is, can we set up a mechanism -- you know, Brookfield perhaps put this in some cite out on the cloud and then can we have -- I mean, if they're not going to use any of these studies, it doesn't matter; we don't care. If we're starting from zero, then it just doesn't matter.

But if we are going to be using studies going forward, we need to know what's in them so that we can have those study requests to fill in the gaps by next month. And as has already been noted, this is a huge administrative

undertaking. I mean, when you look at all of the dams and the waters that are affected by these two relicensings, it's much bigger than anything that happens in the State of Maine and in the FERC relicensing world.

So if we just kind of pretend that this is OPS-normal, I really don't think we're going to get an outcome that's going to be a good one. So is that something that you can take for action, sir?

MR. CREAMER: Well, it's something that we can certainly look at and try to figure out where, you know, the best place, this information is taking place. You know, we have had, like I said, a conversation with Brookfield, so -- with possibility of setting up a relicensing website.

I don't know where they area on that; but certainly if -- you know, the information that's in the PAD is based on those prior studies. So somewhere along the way, the PAD's in the record, the supporting documentation for the PAD must be there as well.

Whether or not it's in -- on a relicensing website that Brookfield sets up, it's still information that should be available on eLibrary in this office for these projects.

MR. HINES: I agree --

MR. CREAMER: Those old study reports and things of that nature should be available in the public domain.

MR. HINES: I agree, and I would just ask that until they are, it's going to take us at least 60 days -- you know, just based on what's in the PAD, it looks like Brookfield intends to use substantial amounts of information that was collected quite a while ago.

I think some of the most recent data is about 15 year old, and some more than 30. And once again, given the size of the project, it's really problematic. So I would hope that we would have 60 days from when this stuff is made available to us to be able to submit study requests. Because until we know what is going to be used, this is going to put us behind the power curve and really behind the eight ball, as far as my experience goes with the FERC process.

So I really hope that something can be done to address this. Thank you, sir.

MR. CREAMER: Okay.

JIM: Steve, this is Jim --.

MR. CREAMER: From the standpoint of the process plan itself, the only way that we can change the process plan is we get requests to change the process plan. And then we all would have to agree that those changes are necessary.

So I mean it's not something that we're going to do necessarily right off the bat. We would have to look at

whatever, you know, on a case-by-case basis, and whether or not change, and that those deadlines are appropriate.

But in the meantime we can certainly have conversations with Brookfield, Great Lakes Hydro folks about those studies, and what's available and trying to find a place where it is publicly available.

[STEVE:] Right. We're facing deadlines to have study plans presented by-- you know, in early next month. So time is of the essence.

MR. CREAMER: Yes, Steve. I understand. So are we. We're stakeholders in this just like you. So we're in the same position.

VOICE: I guess Steve and Allan just put their case -- I think what we're hearing is, there are some reasons these studies are in the PAD. Folks are looking for the original reports.

VOICE: Correct.

MR. CREAMER: Yes, that's what I hear. That seems to be what I'm hearing.

VOICE: Okay.

VOICE: I mean, we did go through and we analyzed them, and thought we were synthesizing it, and bringing information together which we thought was helpful, but -- we hear the request for the actual reports.

MR. CREAMER: I would say we can certainly

discuss this. You know, as soon as the reports are available --. We can talk about that process and how best to make it happen, but I do think it would be the sooner the better that they are available.

OPERATOR: We do have another question or comment from Jeff Murphy with National Marine Fisheries Service.

Your line is open.

MR. MURPHY: Hi. Great conversation. And I would just suggest for the record that commentary on the PAD be extended until after all these studies, given the reliance on past studies be extended to review all those studies, if in fact the intention is to base the entire relicensing on those studies done 40 years ago. So I would certainly hope that FERC would immediately grant an extension to allow us to fully absorb all that information. Thank you.

MR. CREAMER: Jeff, as I said before, you're going to have to request, or parties are going to request, stakeholders are going to have to request an extension.

If it's your desire to have had an extension to a specific deadline, then the best thing I could advise is file that request for an extension.

MR. MURPHY: Thank you, Allan.

OPERATOR: Once again, to ask a question or make a comment, please press star-one. One moment.

(Pause)

OPERATOR: I'm showing no questions at the moment.

(Pause)

MR. CREAMER: This is Allan Creamer with FERC.

The one thing I would be interested in, let's throw this out there, is the scoping document. I would like to hear some opinions, comments with regard to the scope of issues that we identified, and I would also ask if anybody has any comment that they would want to make at this time, feel free to do so. Or we can discontinue the question and answer session.

OPERATOR: We do have a question or comment from Robert Nestur with American Whitewater.

MR. NESTUR: Thank you. With regard to the scoping document, my question is whether project decommissioning is being looked at as an alternative at any of the projects; and I'm specifically interested in knowing whether that's being looked at at the two lower projects, East Millinocket and Dolby as it relates to fish passage.

MR. CREAMER: Thank you, Robert.

As of now, the way we address dam decommissioning, if you were to read the scoping document. Up until that time, we had no information to suggest that it was an alternative that people wanted to look at.

And so the scoping document right now identifies dam decommissioning as an alternative considered but eliminated from detailed review.

MR. NESTUR: So if the organizations or agencies wanted that to be considered as an alternative, they would include that in their comments by the upcoming deadline for submitting study requests?

MR. CREAMER: You can comment on the scoping document, and the alternatives, and the issues; that would be the place to do it.

MR. NESTUR: Thank you.

OPERATOR: Our next question/comment comes from Casey Clark with MDMR. Your line is open.

MR. CLARK: Yes, thank you.

Specific, the sections on data in the PAD, I will note that there are a couple of pieces that are missing from that; both species of River Herring would be Blueback Herring and Alewives, Sea Lamprey, and we do believe that lamprey are likely present within this project area currently. And then the section on American eel implies that eels are able to enter these projects without any impact. That is absolutely false, and we will be pursuing a request for actual eel counts as part of our formal comments.

OPERATOR: Our next question or comment comes

from Jeff Murphy of the National Marine and Fisheries Service.

MR. MURPHY: Thank you. I do have a comment on Section 4.1.2 in Scoping Document 1, on water and aquatic resources.

FERC proposes to assess the effects of continuing projects, given seasonal release operation of the Ripogenus and Penobscot Mills projects, on fisheries resources -- I think that is updated -- to assess the effects of daily peaking on fisheries resources.

I don't think seasonal storm release adequately portrays that actual operation of the project. Thank you.

MR. CREAMER: Okay, thank you.

OPERATOR: Once again, to make a question or comment, please press star-one [*1].

We have a question or comment.

Our next question comes from Daniel McCaw, Penobscot Indian Nation.

MR. McCAW: Thank you. Good morning.

My name is Daniel McCaw, and I have the pleasure to work for the Indian Nation as a fisheries resource manager, fisheries program manager. And I just want to say my thanks to the Federal Energy Regulatory Commission on the line today, and my thanks to both the Great Lakes Hydro and Brookfield for their time in looking at the issues with

regards to the license.

As you may know, or may not, Penobscot has inhabited the Penobscot watershed since time immemorial. I would personally like to thank the Penobscot elders, both past, present and future, for my ability to be here on this landscape that is their ancestral home. It's traditional in Indian country to say things like that, and I'm glad that I can bring them to these proceedings today.

I just have a few comments that I'd like to make rather quickly with regard to goals and issues that the Penobscot nation has identified with these relicensings. As my colleagues, both federal and state have expressed very eloquently, and Mr. Hines. This is a very complex project, and it will take a lot of hard work by a lot of parties in order to execute this relicensing process.

The Penobscot Nation will be involved in every step of the way. The Penobscot Nation was involved in these relicensings in the 1990s. I think it is accurate and important to remember that hydro relicensings are not strictly issues, they're not strictly habitat issues or wildlife or flow issues. Hydro licensings are social issues.

We, the peoples of the State of Maine and our friends and visitors, we live here. This is our home. It used to be the home of the Atlantic salmon. It is our

home, too, and so the social concerns given, need to be certainly looked at and explored and understood by all parties. Mr. Murphy was correct in saying that the last relicensing was vastly different than today's. Great Northern Paper was the largest employer in Penobscot County; it was the second largest employer in the State of Maine at the time of the last relicensing.

Dozens and dozens of state legislators wrote FERC comment letters during the relicensing process, pleading with the FERC to consider the economic effect on the entire region, as thousands of people, thousands of small businesses were linked into and dependent for their living on the mills that operated in Millinocket, East Millinocket -- not just the people who worked at the mills, but the entire community that supported those mills, and provided for those people.

The social landscape has changed, dramatically. Now we have an energy investment company; I don't know if that affects current owners, but we have an energy development company who is Ace in a foreign country, and the energy today is generated -- it's not to support an entire region, what was known today, still known today at least to Colonial folks, is the Katadonry (ph), the entire region. But it's not sustained today, and I'm hopeful that the PAD, although it does have some excellent information in it, the

PAD seems to be a document that looks at the entire picture by looking at a one-by-one inch frame in the corner, and the rest of it is not seen or mentioned.

And I am hopeful that through the comments on the PAD and through the FERC's diligence and fiduciary responsibility as a stakeholder, that we can shine a light on this relicensing that we will also experience only once in our career. Mr. Creamer, you may have participated last time, and my boss, John Banks, did it last time. But there's very few who will participate in the next one on this call today.

I'm hopeful that we can consider this not as a fish issue, not as an eel issue or a salmon issue, although they are all intertwined; this is a watershed issue, a people issue and a social issue and an energy issue. And in the face of climate change, which is the greatest threat to human health - greater than the pandemic -- we must make the right decisions today not only for our tribal brothers and sisters but for all people in the State of Maine and all people in the United States.

And I thank you for the opportunity to speak today, and I look forward to participating in future calls on this most important subject. Thank you.

MR. CREAMER: Thank you very much for your comments.

Yes, I was around and did see the original, or the licensing back in the 1990s. As a matter of fact, I did work with the applications. That's as far as I went with it, but as I was around to see it.

OPERATOR: Once again, if you have a question or to make a comment, please press star-one.

We do have another question or comment, one moment.

Our next question comes from Dean Vopane with Ambajejus Lake Y Owners Association. Your line is open.

MR. VOPANE: Good morning. Thank you for the opportunity to speak. Not only am I on this call, but I participated in the original relicensing in the 1990s, and I've probably forgotten more about this project than I learned this time around.

I am President of the Ambajesus Lake Lot Owners Association. We have over 200 members. We are part of the hundreds of recreational and terminate year-round residences on these impoundments. And one big change from the last time to this time is that at the first relicensing, these recreational and full time year round residences were on leased land. Since that time, the vast majority have purchased their property and have a tremendous investment. And any changes in operation, especially to lake levels, has to take into account the impact on the hundreds of Maine

citizens.

Even though the entities have been devastated by the loss of the paper industry, Brookfield remains the largest taxpayer, town of Millinocket and in the town of East Millinocket. And any talk of decommissioning has to consider the impact on the entity, or any act of that nature.

Thank you. That's all I have to say this morning.

MR. CREAMER: Thank you for your comment.

OPERATOR: Once again, ask a question or make a comment, please press star-one.

One moment.

(Pause)

We do have a question coming from Steven Hintz with Trout, Unlimited. Your line is open.

MR. HINTZ: Yes. There have been a number of flow occursion, excursion events over the last ten years; instances where minimum flows have not been -- generally they've been through the weather events. Can you tell me just how often these have been happening and when the last flow excursion occurred?

JIM: Randy, this is Jim. I think that's information we could probably -- but Steve, I don't think we have that information at our fingertips at this time.

MR. HINTZ: From looking back, it looks to me like there's about, at least ten instances of this. This has happened with some frequency over the years. Can you say at least that much?

JIM: Just for clarification, you're talking about ten times over the last ten years?

MR. HINTZ: Yes.

JIM: We can confirm that.

MR. HINTZ: Okay. Thank you, sir.

OPERATOR: Our next comment comes from Robert Ander
with American Whitewater. Your line is open.

MR. ANDER: Is this a meeting where we can comment on our general concerns or interest in particular resources? Or is that at a later time in today's agenda?

MR. CREAMER: No, you can comment on that now if you'd like.

MR. ANDER: Just very briefly, I just want to flag a few issues for you. We are, many of you may know, a national Whitewater River Conservation and Recreation organization. We have a great interest in the Penobscot River. It's a very important whitewater recreation resource, and we certainly have been appreciative of the whitewater releases from the -- station. It's important throughout the whole Northeast Region and the recreation

economy; certainly in the Millinocket areas, folks travel up to that area for really some unique whitewater boating there.

But the relicensing raises a couple of issues that I want to flag. Obviously it's an opportunity, a once-in-a-generation opportunity to look at the use of the resource for recreation currently; what opportunities may exist in the future that we should be exploring.

There are three that I'd like to identify, and of course we will follow them up with written comments and study requests. At the Ripogenus project, we have a great interest in the bypass reach below the dam; I believe it's a three quarter mile reach there, with fishing gradients that provide whitewater recreation opportunity. We'll be looking at -- have put together a boating study, look at appropriate flows below the dam, directly below the dam, between there and McKay station.

We believe that pictures of flow, access to the Penobscot River below the dam as well as flow information are the issues that we expect to explore. We'll also be looking at issues of flow access information at the powerhouse currently, and ways in which that can be improved if necessary.

At the Penobscot Mills project, there are several issues that we are looking at. The Millinocket Lake

storage, there are upflows, Millinocket stream, my understanding is that there is a minimum flow there, but we believe that that's essential for whitewater recreation or other types of recreation for the Millinocket Stream that are being influenced by project operations and the use of those waters for the hydropower operations that might alternatively be used to provide whitewater recreation. Issues of flow access and information are all ones that we would expect to address in our comments and study requests.

Lastly, the issue that I want to highlight; I believe it's the Millinocket project, the natural river channel or bypass reach there, does potentially provide an additional opportunity for whitewater recreation if sufficient flow access and information is provided there.

So it's really these three bypass reaches that are drawing our attention, and we expect to file some study requests to better understand the project operation; studies to identify minimum acceptable and optimal flows in each of those bypass reaches, and how that opportunity might be improved through relicense. Thank you.

MR. CREAMER: Thank you, Robert.

OPERATOR: Our next question or comment comes from Daniel McCaw with the Penobscot Indian Nation. Your line is open.

MR. McCAW: Thank you. Hi, this is Daniel McCaw

again with the Penobscot Nation.

Mr. Creamer, I have two questions that I'm hoping you can help me with. The first question is: In light of climate change and the dramatic changes that have been documented in our global environment, a lot of federal agencies have received guidance in many forms with regard to how they should update, change or manipulate their operations and decision-making processes to incorporate those decisions under the lens of climate change.

And I'm curious, has the FERC, the regulatory commission, received any guidance in any form with regard to climate change and how to adapt their processes under that lens?

MR. CREAMER: We generally, we look at things on a case-by-case basis. Climate change is not specifically looked at; however, if there are objects, we might look at it to some extent. But we don't -- it's not a normal practice.

MR. McCAW. I see, thank you. And to your knowledge, Mr. Creamer, has there been any guidance from any federal agency or within the FERC itself to incorporate a new standard and/or new processes with regard to climate change?

MR. CREAMER: The only thing that we are operating under right now are the new NEPA regulations.

Those are the only ones that I'm aware of that we are doing. There are also some new regulations concerning water quality certification and how that works into our process.

Those are the only two that I'm aware of where we have recently updated our practice in terms of how we look at things.

MR. McCAW: Excellent. Thank you, sir. I appreciate your answers and your knowledge on the subject.

The other question I have for you, Mr. Creamer, and again I appreciate your time today. Back in July of 2018 in the U.S. Court of Appeals in the District of Columbia Circuit Course, there was a case settled between American Rivers and the Alabama Rivers Alliance against the FERC and the Alabama Power Company. My understanding is that the decision made on that day in 2018 reprimanded the FERC for not considering the baseline position during their environmental analysis as the original, un-damed position.

And I'm curious, if that decision in 2018 has had any affect on FERC operations or if there's been any guidance passed down through the FERC to folks like yourself who handle these projects to take into consideration the decision that was made that day in 2018?

MR. CREAMER: You know, the only thing that I will say in regards to that, and then I believe we have, our staff attorney is on the call, too, and I might ask them to

jump in. But I am fully aware of that court case and that decision; that was a case that I was involved in, and we do -- our baseline is the current conditions. And it's my understanding of that court case where it's talking about the baseline, we were asked to look at the baseline as it pertained to I think threatened and endangered species. And how we went through our Endangered Species Act consultation.

I think there was also some discussion relative to that set. So obviously it's been three years since then, and the way we do things now has been adjusted. You know when a court case comes out, adjustments are made in how we handle projects. So to say that we didn't make some adjustments, I would probably not be telling you the truth. There have been adjustments made but not just solely for that reason.

Is Abigail out there on the line? And can she be moved over?

OPERATOR: Yes. Abigail, if you could please press star-zero.

One moment, she has signalled.

MR. CREAMER: Okay, thank you.

OPERATOR: Abigail has joined.

MR. CREAMER: Hey, Abigail. I was kind of hoping you could touch a little bit about on the people aspect of the 2018 case involving Alabama Power and the FERC, and how

that has affected what we do.

ABIGAIL: I think you've covered it well, actually, Allan. Anything further, and it would be best if it was a written discussion.

MR. CREAMER: Okay, that's fine. You know, I tried to keep it general.

ABIGAIL: Yes. No, I appreciate that. Thank you.

MR. CREAMER: I just wanted to give you a chance to weigh in or comment on that aspect.

ABIGAIL: That's what I'm comfortable saying. Thank you.

MR. CREAMER: Okay. I guess that constitutes our answer to that question.

ABIGAIL: Yes.

MR. McCAW: Well, thank you, Mr. Creamer. I appreciate that, and Attorney Abigail, I'm sorry, I missed your last name, but thank you for your time today. It's certainly something that I know the stakeholders here in Maine are concerned about.

Would it be appropriate with comments to the PAD or with the Notice of Intent, Scoping Document 1, those kinds of things -- would that be an appropriate venue to ask for additional information to understand the guidance that the FERC is currently under? And if so, the challenge that

I would find if that is the case, is that in preparing study requests I think it would behoove us to know what the current guidance is for the FERC with regard to that court case.

So would it be possible for me to submit a written request today and try to get some information for myself, the Penobscot Nation, and my stakeholders?

MR. CREAMER: My response to that would be certainly you should submit a request for clarification with those things, and then anything that we would provide would also be in the public record.

MR. McCAW: Excellent. Thank you, sir, for your time.

OPERATOR: Once again, to ask a question or make a comment, please press star-one.

If you have a question or a comment. Steven Hintz, your line is open.

MR. HINTZ: Yes, a question. In different places in the PAD, it talked to access in terms of both project and non-project use recreation sites. I know, and this is something I do myself, I do get access to the West Branch there below the powerplant on down to the Falls, and so do other people, there are pull-off sites where people park.

This, you know, as far as I can remember going back at least 25 years, there's always been access allowed.

But just looking back through the PAD, I'm not seeing anything where this is formalized in any way; it appears that it's only discretionary, and I don't see it as a prior license condition.

It would seem like at this point there would almost be an easement established by the user; but I'm unsure. Would someone from Brookfield just describe if the allowed access fishing point is discretionary, or is it a license condition, or what is it?

[Brookfield] I don't believe it's a license condition.

MR. DORMAN: Yes. And I think, Steve, you've brought up a great point, and that is throughout this system you have a mix of different entities and recreation sites. So obviously there's the one. We highlight -- those that are (inaudible) -- but then between the Penobscot River, between woods, there's another tab; let's say managerial rights on these lands.

So we try to in the Pre-Application Document to explain that as well as possible. If there are questions, I think those would be the type of questions to include in a letter and we would address those over the course of the proceeding.

MR. HINTZ: I mean, we can certainly put that in a request for information as part of our PAD comments, but

as I just wondered if there was -- you know, it seems like there'd be an easy answer. You know, if it's discretionary it's discretionary. Is it?

I mean, the reason why I'm asking is there have been areas near a project, a number of Maine projects that Brookfield is the licensee where the access has been fenced off for different reasons so -- that are Brookfield's reasons. Like for instance below the powerhouse, that could be used.

In years past could be, climb down on the rocks below where the water comes out and fish from there and get some fish. And that's all fenced off now, has been for years.

It's things like that are what is prompting my question.

VOICE: Randy, we may need to pull someone else in. I mean, I think you bring up a great point in certain areas. From a public safety perspective and a security perspective, there are some areas that have been fenced off.

My only hesitation is there are those defined areas where formal recreation sites have been established. I think there's going to be areas around each of the facilities that have public access. It's just that there's some areas where, in the private land and managed by others. It's just hard to say without looking at a map and talking about specific areas.

MR. BURNS: Kevin Burns here, from Brookfield.

To definitively say that -- I'm pretty confident that's not a project --.

VOICE: So essentially, so what you're saying is it is -- it's discretionary, correct?

MR. BURNS: This is Kevin Burns. The Great Lakes Hydro America is not only the area that Steve was talking about, downstream of a station; those areas are part of the areas that were granted to the State of Maine in I believe it was 1981. So it's been quite a while. Those areas are kind of -- and (inaudible) those areas. I believe they're -- by, depends, forest management. And it definitely is not Great Lakes Hydro America and it's out of the project boundary.

So we really don't have any say over what goes on downstream near that station.

VOICE: So I'll have to review the documents; and I thought they were part of the project boundary. I'll have to review that. Thanks for the response.

MR. BURNS: Thank you.

OPERATOR: Once again, to ask a question or make a comment, please press star-one.

If you have another question or comment. Steven Hintz, Trout.

MR. HINTZ: Yes. A couple times this morning

we've talked about the dewatered reaches of the main stem of the Penobscot River which exist in the Upper Gorge and below Stone Dam. These are impaired waters, and as I understand environmental law, there should have been an attainability analysis, a use attainability analysis performed on those.

The PAD does represent one for the waters upstream, you know, in the impoundment above Rip Dam, but it doesn't include the content of that. If these documents exist, we've already talked about reliance on old studies and prior things that happened 30 years ago. Can we get those, if they exist? And could we have that provided along with the other documents that are referenced when that gets resolved?

MR. CREAMER: Randy, I leave that question to you.

MR. DORMAN: There is no UAA for either of those locations.

MR. HINTZ: Okay, and can you guys provide the ones for Chesuncook and the impoundment upstream of Rip?

MR. DORMAN: We can look. I don't know that I have seen that document. I've seen --

MR. HINTZ: You referenced it in the PAD; that's why I'm asking, yes.

VOICE: Yes.

MR. CREAMER: If you talk about it --.

VOICE: All right, go ahead.

MR. CREAMER: This is Allan Creamer. If you're talking about a use attainability analysis, isn't that something that could be gotten from Maine EDP?

VOICE: Is this a question for Brookfield?

MR. CREAMER: I'm just throwing that out there. You know, we're talking about a user attainability analysis and where the information is, and trying to get the information. I would think that it's information that would be on Maine's EDP website or -- and/or the EPA's website.

Am I mistaken on that?

VOICE: No, Allan, I think you're correct. and to that point, we referenced it in the PAD; it exists; I've seen some summary documents on it. I don't know if we've seen the actual product that came out of the process.

But let us take a look, and obviously that's -- a general theme of the conversation this morning is that some of the studies that we summarized and other aspects, folks are looking for the original documents.

VOICE: If we don't have it, EPA or EDP would have it,

MR. HINTZ: Well, I guess my point is is that if we're going to reference these documents in the PAD, you know, we would certainly like access to them. Once again, we're looking at a very long temporal face here, and if

Brookfield is saying these documents exist, great. You know, let's see them. That's what we're asking, and I would certainly hope that they could provide this for us if they are going to reference it.

OPERATOR: Once again, to ask a question or make a comment, please press star-one.

(Pause)

We have a question or a comment coming from Steven Hintz with Trout, Unlimited.

MR. HINTZ: Yes, just one final question. The Upper Gorge which is called the bypass reach, I guess looking back, it looked like this was designed to improve the water quality downstream -- in the gorge and downstream. Is that warm water or cold water that's coming into the bypass channel? Is there data on, temperature data on how the bypass channel gets watered? It happens every year between July 1st and September 30th. Is there data on that? And what the effect of it is on the Maine flow downstream?

MR. DORMAN: I believe -- this is Randy -- I believe there is data.

Kevin, are you still on?

VOICE: Can you hear me?

MR. DORMAN: Yes.

KEVIN: The 100 cfs is discharged through log sluice, a former log sluice so it comes out the surface.

Although actually right now we're discharging it through a GP, of the lower water level.

So it's whatever the -- you know those sources is at the time. I'm not aware of any water quality or water temperature monitoring that's been done on that water.

VOICE: Thank you, sir.

I guess as a follow up, though, would the information exist into how that -- I know you do have a -- it is part of the licensing conditions that you do have to release that 100 cfs, to water the Upper Gorge for three months out of the year.

Is there data available that says, that shows what the source of that water is?

VOICE: I'm not sure if we have data on the actual source of the water. I mean, 99.9 percent of the time it would be from the surface. You now, we're in a drought right now and that's the only reason that we're releasing water here at the gate.

So I'm sure we have information on when the gate was open and when it was closed, which would be July 1st to October 1st every year. But I'm not sure -- I don't know if we have information on how it was -- almost all the time it's from that log sluice.

MR. HINTZ: But that's not exclusive. As I recall I guess when you had the head of one of these flow

excursions and then had to -- you know, do some corrective action to get things working the way they were supposed to to prevent that, that this isn't the first time that you've used the gate to provide that additional 100 cfs, correct?

VOICE: Again, I'm not sure if it's been done before. If it has, it's been quite a while. I mean, we didn't have a drought like this since 2001-2002. When we have a flow occlusion or a facia tripped or something like that, then yes, we need to open the gate to resume river flow, to do that. That's separate from cfs that's required to be released prior to September, every summer.

MR. HINTZ: Thank you.

OPERATOR: Again, to ask a question or make a comment, please press star-one.

At this time, I'm showing no comments.

Once again, if you would like to ask a question or make a comment, press star-one.

(Pause)

I'm showing no questions or comments. If you would like to ask a question or make a comment, press star-one.

(Pause)

I do have a question or comment coming from Robert Nuster with American Whitewater. Your line is open.

MR. NUSTER: Can you clarify the structure of

bypass reaches -- the Rip dam, on and in the third bypass reach of the Millinocket Project? I'm specifically interested in the capacity of those structures to release variable flows into those bypass reaches.

MR. DORMAN: Randy. I can speak in general in these types of gates here. Bob, I think in terms of getting let's say gate to pass the information over your way, we can do that; I just don't think we have that at our fingertips at this time.

Probably the most downstream, referring to Stone Dam. So there's a series of flash boards there, inflatable bag, and that's the primary release into that system is from overtopping of that spillway.

Like Kevin said, we've got some sluices up at the Upper Gorge, that jump in from the top there, into that bypass reach. And at Middle Dam there is a gate release there. But unless somebody else knows off the top of their head, we're going to have to follow up with that information.

MR. NUSTER: I think you understand the question. It's beyond what minimum flows might be required at those various locations. I'd like to understand whether the project has the ability to provide naturally-occurring flows into those sections of the river.

VOICE: Yup. You're just looking to get a better

understanding how water flows through those structures and what piping and equipment currently exists. Is that a fair statement?

MR. NUSTER: Yes.

VOICE: Certainly if you want to follow up with the individual, that's fine.

VOICE: We can provide that information.

OPERATOR: Once again, to ask a question or make a comment, please press star-one. One moment.

We do have a question or a comment coming from Steven Hintz with Trout Unlimited. Your line is open.

MR. HINTZ: Yes. There are pumping operations between Millinocket Lake and Ambajejus Lakes, and how much do the water levels vary at either of those lakes due to the pumping operation?

VOICE: Kevin, do you have that off the top of your head?

VOICE: (inaudible) the pumping of water levels, that I don't have off the top of my head. I do know Millinocket Lake is lower than the north plant pilot. Of course it depends on, you know the difference depends on the water level on each one of them. It's a matter of several feet. That's really all I can say generally.

VOICE: Okay, we'd have to ask specifically, I guess, for more information. And that would include the

North Twin Lake as well, correct?

VOICE: North Twin Lake is part of the North impoundment. So (inaudible) station, the Ambajejus Lake portion of the North impoundment and then it would run into Twin Lake.

VOICE: Okay, thank you.

OPERATOR: Once again, to make a question -- if you have a question, make a comment, please press star-one.

Our next question or comment comes from Daniel McCaw, the Penobscot Indian Nation.

Your line is open. Mr. McCaw?

MR. McCAW: Oh, I'm sorry. I was on mute. My apologies. I was trying to be polite, but evidently too polite. Thank you for the ability to ask another question.

My question is this, and is directed to Mr. Creamer from FERC. Mr. Creamer, a few moments, a FERC attorney named Abigail was on the line. I was wondering if you could give me Abigail's full name and how I would reference her.

MR. CREAMER: Her name is Abigail Kristof, and she is our staff attorney assigned to the project.

MR. McCAW: And Mr. Creamer, could you be so kind as to spell Attorney Kristof's last name for me, please.

MR. CREAMER: Good question. I believe it's -- and she can correct me -- C a r i s c o p h.

MR. McCAW: Excellent. Thank you so much for your time, Mr. Creamer. I appreciate it.

MR. CREAMER: No problem.

OPERATOR: Once again, to ask a question or make a comment, it is star-one.

(Pause)

I'm showing no questions or comments at this time. But once again, if you would like to ask a question or make a comment, it is star-one.

(Pause)

I'm still showing no questions or comments.

MR. CREAMER: If we don't get anything further in the next minute or two, we have reached 11 o'clock, which was the two hours for the meeting.

OPERATOR: Okay.

(Pause)

OPERATOR: I do have two minutes after the hour, and I'm still showing no questions.

MR. CREAMER: Okay, I think we're going to go ahead and wrap up. So this is Allan Creamer with FERC. We have reached 11 o'clock or two minutes past 11. The meeting was scheduled from 9 to 11, and if there are no further comments or questions, then we can wrap this portion of the meeting up. And I would thank everyone who participated, a lot of good information, a lot of good questions, a lot of

good comments. Certainly look forward to reading the comments that come in and look forward to the virtual site tour coming up this afternoon.

OPERATOR: Thank you for your participation.

[Whereupon, at 11:05 a.m., the meeting concluded.]

CERTIFICATE OF OFFICIAL REPORTER

This is to certify that the attached proceeding before the FEDERAL ENERGY REGULATORY COMMISSION in the Matter of:

Name of Proceeding:

Ripogenus Hydroelectric Project and

Penobscot Mills Hydroelectric Project

Great Lakes Hydro America, LLC

Docket No.: Project 2572 & 2458

Place: Virtual Meeting

Date: Thursday, September 9, 2021

were held as herein appears, and that this is the original transcript thereof for the file of the Federal Energy Regulatory Commission, and is a full correct transcription of the proceedings.

DAN HAWKINS

Official Reporter

September 13, 2021

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E
Washington, DC 20426

**RE: Extension of Time Request for the Ripogenus (FERC No. 2572-133) and Penobscot Mills (2458-247) Hydroelectric Projects**

Dear Secretary Bose:

We are requesting an extension of time to file comments on the Pre-Application Document (PAD) for the Ripogenus and Penobscot Mills projects. Additionally, as detailed below, we are requesting additional information that is missing from the PAD.

On September 10, 2021, the National Marine Fisheries Service (NMFS) attended the Ripogenus (FERC No. 2572) and Penobscot Mills (FERC No. 2458) virtual scoping meeting hosted by the Federal Energy Regulatory Commission (Commission). At the meeting, stakeholders noted that, to date, Great Lakes Hydro America, LLC (GLHA; Applicant) had not provided the studies referenced in the Pre-Application Document (PAD). However, in the PAD the Applicant states "…GLHA maintains that a full suite of new studies is not needed, that the vast body of information on which today's certifications and licenses are soundly based and should be relied upon for these relicensings. In addition, consistent with the Commission's criteria for study requests, the scope and extent of any new study be focused on addressing specific data gaps necessary to inform the development of license requirements." While broad summaries of the studies performed during the last relicensing were provided in the PAD, a refined synthesis of the data was not provided, nor did GLHA identify any data gaps. Consequently, without the original studies, stakeholders cannot identify existing data gaps to inform their respective study requests. Therefore, we request that you require the Applicant to provide stakeholders with each study referenced in the PAD and asks that the Commission grant a 90-day extension of time, from when the studies and associated additional information (see below) are received, to submit PAD comments and study requests for the Ripogenus and Penobscot Mills licensing proceeding. We also request that you require the Applicant provide us with 10 years of operations data for each project including: 1) daily impoundment elevations; 2) daily outflows for each project (minimum, maximum, and average daily discharge). These data are critical for us to develop comments on the PAD and identify data gaps and any new studies.

We would also like to express our disappointment with the general public meeting held by FERC for these projects during the evening of September 9, 2021. We understand the challenges associated with holding public meetings under the constraints necessitated by the current Covid-19 pandemic. However, the meeting participants, including agency staff and the public, were not

afforded an opportunity to hear questions and responses during the teleconference meeting. Instead, when a meeting participant posed a question to FERC or GLHA, they were placed on a private line so that the rest of the meeting participants could not hear the conversation. Depriving the resource agencies, stakeholders, and the public the opportunity to hear questions and responses during the public meeting was exactly contrary to the purposes of the public meeting. We request that FERC schedule another public meeting with open lines of communication where all participants are able to hear all questions and answers. Releasing a transcript of the public meetings is not enough as that still deprives the opportunity for someone to ask questions that would have been prompted by responses from FERC or the Applicant.

Please direct any questions regarding this request to Dan Kircheis at Dan.Kircheis@noaa.gov

Sincerely,

Julia E. Crocker

Julie Crocker
Endangered Fish Branch Chief

cc: Service List

**PENOBSCOT NATION**

DEPARTMENT OF
NATURAL RESOURCES

JOHNS BANKS, DIRECTOR

12 WABANAKI WAY
INDIAN ISLAND, ME 04468
TEL: 207/827/7776
FAX: 207/817/7466

September 13, 2021

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E
Washington, DC 20426

**RE: Extension of Time Request, Data Request, Legal information request and repeat of the Public Scoping meeting request for the Ripogenus (FERC No. 2572-133) and Penobscot Mills (2458-247) Hydroelectric Projects**

Dear Secretary Bose,

On September 10, 2021 the Penobscot Indian Nation (PIN) attended both of the Ripogenus (FERC No. 2572) and Penobscot Mills (FERC No. 2458) virtual scoping meetings hosted by the Federal Energy Regulatory Commission (the FERC). This included the morning session with Resource agencies and the Public meeting, held in the evening.

A relicensing of this size and scope will not happen again in Maine or the Northeast region of the United States for 40 years. The decisions made during this relicensing process will affect the entire West Branch of the Penobscot River, a drainage over 2,000 square miles and present and ancestral home of the PIN. The West Branch contained vast quantities of high gradient, cold water, and climate resilient habitat before it was dammed and industrialized to support the Great Northern Paper mills in Millinocket nearly 100 years ago. These antique structures, long past the life span of concrete, continue to negatively alter the social, economic and environmental systems of an entire region, for the economic benefit of a foreign energy company. It is imperative that decisions, comments and questions be built from a working knowledge of all the studies from the last relicensing, a assessment of the ecological potential of a dam-free West Branch, and present/past operating conditions at each facility.

The PIN believes that the best fish passage and the best chance for restoration of the West Branch Penobscot River ecosystems is dam removal for all the projects in this relicensing.

**Request for past studies and extension of time:**

Many stakeholders noted during the agency meeting that, to date, the licensee had not provided the studies referenced in the Pre-Application Document (PAD). As a representative for the licensee in the process, HDR employee Jim Gibson went so far as to say the licensee did not have many of the documents, and was relying on summary tables of unknown date, unknown origin and unknown author. Yet, the licensee states in the PAD:,

> "…GLHA maintains that a full suite of new studies is not needed, that the vast body of information on which today's certifications and licenses are soundly based and should be relied upon for these relicensings. In addition, consistent with the Commission's criteria for

study requests, the scope and extent of any new study be focused on addressing specific data gaps necessary to inform the development of license requirements."

The PIN finds this situation challenging in its efforts to assess the PAD and to submit comments and study requests. The licensee admittedly made statements in the PAD based on incomplete data and summary tables. The PIN empathizes with the FERC and all other stakeholders who find themselves in the same position. That is, a position of trying to respond and comment on a document based on incomplete data, and not knowing where fact may be found within the array of assumption and invention.

Stakeholders cannot identify existing data gaps to inform their respective study requests without the original studies referenced in the PAD.

The PIN requests that the licensee provide stakeholders with each study referenced in the PAD, the additional information requests outlined below, and asks that the Commission grant a ninety-day extension of time from when the studies/information are received to submit PAD comments and study requests for the Ripogenus and Penobscot Mills licensing proceedings.

**Additional data request:**

The resource agencies have also identified other data gaps that must be filled for the proper review and understanding of the issues of these relicensing's.

The PIN requests that the licensee provide 10 years of head-pond elevation and 10 years of daily flow conditions for each project involved in the relicensing (min, mean, and max flow) . This data is needed to understand flow conditions and operations on the West Branch of the Penobscot River, as there are no flow gauges on the system or other data available. This data would be critical to understanding the environmental impacts of the projects and to inform study requests. This information would have been appropriate to be included in the PAD.

**Legal information request:**

The PIN asked Mr. Creamer of the FERC during the Scoping meeting to explain the directives, orders, or other guidance documents that FERC relicensing staff were responding or operating under after the United States Court of Appeals for the District of Columbia circuit, No. 16-1195, American Rivers and Alabama Alliance v. FERC, and the US Dept. of Interior. The case was argued January 12, 2018 and decided July 6, 2018. (2018 decision) Mr. Creamer of the FERC was personally involved in the case as a FERC employee, and explained in general terms that the FERC normally will assess the project environmental baseline as the current conditions. He also seemed to indicate that endangered species issues and cumulative effects were some of the factors in determining if baseline conditions were indeed the ancestral condition or the present modified conditions. FERC attorney Abigail Christoph joined the call to clarify. She stated that the question would need to be asked in writing and that the FERC would respond in writing.

The PIN requests that the FERC provide the PIN and other stakeholders with any and all information with regards to the FERC response to the 2018 decision, and asks what guidance FERC staff has received with regards to the 2018 decision. For example, has the FERC changed its own statutes, procedures, laws or directives? Have there been changes in FERC process in other recent relicensing's in regards to the 2018 decision? Any information or documents the FERC could provide would be greatly beneficial for properly reviewing the PAD, drafting study requests and all other stopes in this massive relicensing.

**FERC Scoping meeting for the public, September 10th, 2021:**

The PIN would like to express its concern over the handling and execution of the Scooping meeting by the FERC. The FERC held a public scoping meeting by telephone, in response to guidance over the global Covid-19 pandemic. PIN staff attended the meeting and realized that a major deviation from the normal scoping process was happening. Scoping meetings for the public always allow for participants to hear the comments given by other stakeholders. This process allows the public to understand the issues, and to hear the diversity of interests from their neighbors and fellow citizen tax-payers. Only the first speaker of the night would not have the benefit of hearing what others may think of the issues at stake. In the Scoping meeting held on September 10th, 2021, no one got to hear the comments of the other interested parties. Citizens were

placed into a private, digital location from their phone line and had an opportunity to give a five minute comment. No person got to hear a single comment or question by any other interested parties.

The PIN believes this to be a major deviation from the public scoping process, and one that may have discouraged public participation through the process. The public scoping process touches a minimum of citizens and sometimes touches no one at all. Only those citizens who read the FERC website, read the Federal register, or read their local newspaper's legal announcement sections would have any idea a relicensing was occurring. Here in 2021, there has been an exponential increase in the number of information portals available to public and private institutions and people. The FERC has not adapted to the times in its public scoping techniques, and has done a further disservice to the tax-payers of Maine by not allowing them to hear the comments of their neighbors and other interested other parties, as is traditional in the Scoping process.

The PIN requests that the Public Scoping meeting for these relicensings be repeated at the earliest convenience. The Public Scoping meeting should provide the opportunity for stakeholder to listen to the other interested parties and to give their own comments in turn.

The PIN looks forward to hearing from the FERC in a timely manner. The PIN continues to review the PA and draft study requests. However the PIN is currently experiencing great challenges in this effort due to the missing studies, flow and head-pond elevation data and without any information of the response of the FERC to the 2018 decision. The PIN appreciates the opportunity to provide these comments and requests.

Please reach out if you have any questions.

Sincerely,

Dan McCaw

# United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Maine-New Hampshire Fish and Wildlife Service Complex
Ecological Services
Maine Field Office
P.O. Box A
306 Hatchery Road
East Orland, Maine 04431
207/469-7300 Fax: 207/902-1588

September 14, 2021

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E
Washington, DC 20426

**RE: Extension of Time Request for the Ripogenus (FERC No. 2572-133) and Penobscot Mills (2458-247) Hydroelectric Projects**

Dear Secretary Bose,

On September 10, 2021 the United States Fish and Wildlife Service (Service) attended the Ripogenus (FERC No. 2572) and Penobscot Mills (FERC No. 2458) virtual scoping meeting hosted by the Federal Energy Regulatory Commission (Commission). At the meeting, stakeholders noted that, to date, Great Lakes Hydro America, LLC (GLHA; Applicant) had not provided (1) studies referenced in the Pre-Application Document (PAD); or (2) operations data for any of the projects. In the PAD the Applicant states "…GLHA maintains that a full suite of new studies is not needed, that the vast body of information on which today's certifications and licenses are soundly based and should be relied upon for these relicensings. In addition, consistent with the Commission's criteria for study requests, the scope and extent of any new study be focused on addressing specific data gaps necessary to inform the development of license requirements." While broad summaries of the studies performed during the last relicensing were provided in the PAD, a refined synthesis of the data was not, nor were any data gaps identified by the Applicant. Without the original studies, and without operations data for each dam, stakeholders cannot identify existing data gaps to inform their respective study requests or their PAD comments. Therefore, the Service respectfully requests that the Commission require the Applicant to provide stakeholders with ten years of operations data for each project including, but not limited to, daily impoundment elevation and daily outflows for each project (minimum, maximum, and average daily discharge). The Service also asks that the Commission require the Applicant to provide stakeholders with each study referenced in the PAD and that the Commission grant a 90-day extension of time, from when studies and operations data is received, to submit PAD comments and study requests for the Ripogenus and Penobscot Mills licensing proceeding.

Thank you for this opportunity to comment. Please direct any questions to Julianne Rosset at *julianne_rosset@fws.gov*.

Sincerely,

AMANDA CROSS Digitally signed by AMANDA CROSS Date: 2021.09.14 09:34:39 -04'00'

Amanda S. Cross, Ph.D.
Project Leader
Maine Field Office
Maine-New Hampshire
Fish and Wildlife Service Complex

cc: PIN, Dan McCaw
NMFS, Jeff Murphy
MEDEP, Christopher Sferra
MEDMR, Casey Clark
MEDIFW, John Perry
RO/Fisheries, Brian Sojkowski
ES: JRosset:9-14-21:(603)309-4842

STATE OF MAINE
DEPARTMENT OF MARINE RESOURCES
21 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0021

JANET T. MILLS
GOVERNOR

PATRICK C. KELIHER
COMMISSIONER

September 15, 2021

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission888 First Street, N.E
Washington, DC 20426

**RE: Extension of Time Request for the Ripogenus (FERC No. 2572-133) and Penobscot Mills (2458-247) Hydroelectric Projects**

Dear Secretary Bose:

The Maine Department of Marine Resources (MDMR) is requesting an extension of time to file comments on the Pre-Application Document (PAD) for the Ripogenus and Penobscot Mills projects. In addition, as detailed below, we are requesting additional information that is missing from the PAD.

On September 10, 2021, MDMR attended the Ripogenus (FERC No. 2572) and Penobscot Mills (FERC No. 2458) virtual scoping meeting that was hosted by the Federal Energy Regulatory Commission (Commission). Stakeholders noted during the meeting that Great Lakes Hydro America, LLC (GLHA; Applicant) had not provided the studies referenced in the Pre-Application Document (PAD). While the PAD included summaries of the studies performed during the last relicensing, a synthesis of the data was not provided, nor did GLHA identify any data gaps. Without the original studies, stakeholders cannot identify existing data gaps to inform their respective study requests. Therefore, we request that the Commission require the Applicant to provide stakeholders with each study referenced in the PAD and asks that the Commission grant a 90-day extension of time, from when the studies and associated additional information (see below) are received, to submit PAD comments and study requests for the Ripogenus and Penobscot Mills licensing proceeding. We also request that you require the Applicant provide us with 10 years of operations data for each project including: 1) daily impoundment elevations; 2) daily outflows for each project (minimum, maximum, and average daily discharge). These data are critical for us to develop comments on the PAD and identify data gaps and any new studies.

OFFICES AT 32 BLOSSOM LANE, MARQUARDT BUILDING, AUGUSTA, MAINE
http://www.Maine.gov/dmr
PHONE: (207) 624-6550
FAX: (207) 624-6024

We would also like to express our disappointment with the general public meeting held by FERC for these projects during the evening of September 9, 2021. When a meeting participant posed a question to FERC or GLHA, they were placed on a private line so that the rest of the meeting participants could not hear the conversation. We request that FERC schedule another public meeting with open lines of communication where all participants are able to hear all questions and answers.

If you have any questions or need additional information, please contact Casey Clark at casey.clark@maine.gov or (207) 624-6594.

Sincerely,

Patrick C. Keliher, Commissioner

cc: Sean Ledwin, Casey Clark, MDMR
John Perry, DIFW
Kathy Howatt, DEP
Amanda Cross, Julianne Rosset, USFWS
Jeff Murphy, NOAA
Dan McCaw, PIN

OFFICES AT 32 BLOSSOM LANE, MARQUARDT BUILDING, AUGUSTA, MAINE
http://www.Maine.gov/dmr
PHONE: (207) 624-6550 FAX: (207) 624-6024

September 16, 2021

Ms. Kimberly D. Bose
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

TROUT UNLIMITED
MAINE COUNCIL

**Via online submission to: http://www/ferc.gov (cross-filed)**

Subject: **Preliminary Comments of Maine Council of Trout Unlimited on the Notices of Intent and Pre-application Documents for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458)**

Dear Secretary Bose:

On behalf of its six chapters and over 2,000 members, Maine Council of Trout Unlimited (TU) submits these comments on the Notices of Intent (NOI) and Pre-application Documents (PAD) for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) filed for Great Lakes Hydro America, LLC by Brookfield Renewable ("Brookfield") dated June 11, 2021.

Taken together, these relicensings reflect over 108,000 kw of generation capacity making this the largest relicensing effort in the state of Maine in terms of electricity production. The waters and surrounding habitat affected by these relicensings are of equal stature. The land-locked salmon fishery below Ripogenus Dam is sustained by naturally spawned fish and nationally known for its quality. With Maine's highest mountain nearby, Ripogenus Gorge below the dam is Maine's most spectacular gorge. The waters of the Penobscot Mills Project are also important in their own right and should play a part in the restoration of sustenance fisheries to the Penobscot Indian Nation (PIN) that have been so long promised but not delivered.

Brookfield's submission places great stock in studies conducted many years ago during the last relicensing.[1] Many of the outcomes for the last relicensings of these projects occurred when the electricity produced went directly to the mills in Millinocket. Any increase in the generation costs would have a potential effect on the economic viability of the mills, and decisions were made on the basis of the jobs and politics involved, not the intent of Maine environmental law. Despite this, the mills are now closed and the electricity sold to the grid, so those factors should not be brought to bear in this round of relicensings. If we are to accept past data and past studies, stakeholders should know exactly what we are accepting and not have to rely on summaries provided by the applicant. Only then will resource protection agencies and stakeholders be able to generate appropriate FERC study requests. It must also be noted that many of the referenced studies are older than the 10 years specified for studies by the courts in American Rivers III.[2]

**Accordingly, TU strongly supports the request by the National Marine Fisheries Service: "*90-day extension of time, from when the studies and associated additional information (see below) are***

[1] Brookfield Notices of Intent and Pre-application Documents for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) dated June 11, 2021, page 1-11. "*GLHA maintains that a full suite of new studies is not needed, that the vast body of information on which today's certifications and licenses are soundly based and should be relied upon for these relicensings. In addition, consistent with the Commission's criteria for study requests, the scope and extent of any new study be focused on addressing specific data gaps necessary to inform the development of license requirements.*"

[2] American Rivers and Alabama Rivers Alliance v. FERC and United States Secretary of the Interior, No. 16-1195 (D.C. Cir. 2018) ("American Rivers III").

***received, to submit PAD comments and study requests for the Ripogenus and Penobscot Mills licensing proceeding."***[3]

After preliminary review, TU specifically requests that the following, listed and followed by where they were first referenced in the PAD, be provided to all stakeholders or placed in on a Internet site where they can be readily accessed:

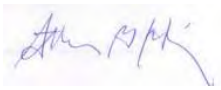
1. (MDIFW 2012) - page 5-92
2. (FERC 1996) - page 5-92
3. (GNNC 1991b) - page 5-93
4. (FishBase 2021c) - page 5-94
5. (GLHA 2011) - page 5-95
6. (MDMR 2021) - page 2021
7. (USFWS 2015a) - page 5-97
8. (Midwest Biodiversity Institute &Center for Applied Bioassessment and Criteria [MBI] 2005) - page 5-113
9. During the previous relicensing of the Project, the Licensee completed an instream flow study in the Upper Gorge to assess the relationship between river flow and aquatic habitat - page 5-117
10. MDIFW unpublished sampling data from 2017 and 2018 - page 5-122 (footnote)
11. Yoder et al. 2008 (Source cited for Lower Millinocket Stream and West Branch (Millinocket Tailrace to Dolby Pond fish assemblage) - page 5-125
12. Instream Flow Incremental Methodology (IFIM) study conducted by the Licensee in 1987 and 1988 in consultation with MDIFW and USFWS - page 5-127
13. An additional IFIM study was conducted on the "deadwater" sections of Millinocket Stream to compliment the initial IFIM study - page 5-127
14. IFIM Study (two sites) -page 5-131
15. (Nedeau et al. 2000) - page 5-133
16. (Swartz and Nedeau 2007) - page 5-133
17. (Swartz 2007) - page 5-143
18. (Dewan & Assoc., 1990b) - page 5-247

Additionally, any IFIM studies or any other documents that have bearing on the dewatering of the main stem of the West Branch of the Penobscot below Stone Dam that the Applicant refers to as a bypass.

Provision of these studies will allow stakeholders including the resource protection agencies to determine which studies are still viable and those that are not - and base their study requests on that determination.

Maine TU Council appreciates the opportunity to provide these preliminary comments on these important projects and hopes that the Commission will act to allow the resource protection agencies to identify potential harms to the resource and thus enable the Commission to balance project harms and benefits.

Respectfully,



Stephen G. Heinz
Maine TU Council FERC Coordinator

[3] National Marine Fisheries Service letter RE: Extension of Time Request for the Ripogenus (FERC No. 2572-133) and Penobscot Mills (2458-247) Hydroelectric Projects dated September 13, 2021.

Brookfield
Renewable

September 17, 2021

***Via Electronic Filing***

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Response to Stakeholder Requests for Additional Information and an Extension of Time to File Study Requests and Comments on the Pre-Application Document**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), a subsidiary of Brookfield Renewable and Licensee of the Ripogenus Hydroelectric Project and Penobscot Mills Hydroelectric Project (collectively referred to as the "Projects"), herein files a response to recent filings by several entities requesting additional information and an extension of time to file study requests and comments on the Pre-Application Document (PAD).

On June 11, 2021, GLHA filed the Notices of Intent and PAD, which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through the Federal Energy Regulatory Commission's ("FERC" or "Commission") Integrated Licensing Process (ILP). Based on the ILP regulations and the Process Plan and Schedule provided in the PAD, FERC issued Scoping Document 1 on August 10, 2021, and subsequently conducted daytime and evening virtual Scoping Meetings on September 9, 2021. Additionally, during the afternoon of September 9, 2021, GLHA hosted a virtual environmental site review, which provided stakeholders with a comprehensive overview of the Projects utilizing drone video, photographs, and PowerPoint slides. Open question-and-answer sessions were held during FERC's daytime scoping meeting, as well as following the Project presentation during the virtual site review. GLHA notes that during the two question-and-answer sessions, all participants were encouraged to provide comments and to ask any questions regarding the Projects, and neither session was concluded until meeting participants had no further comments or questions.

Following the scoping meetings, several entities filed letters requesting that GLHA provide additional information and that FERC grant a 90-day extension of time, following GLHA's providing of the additional information, to file study requests and comments on the PAD. These entities included the National Marine Fisheries Service (NMFS) on September 13, 2021, the U.S. Fish and Wildlife Service (USFWS) on September 14, and the Penobscot Indian Nation (PIN) and Trout Unlimited (TU), both on September 16. Specifically, all entities requested that GLHA provide copies of study reports for each previously completed study referenced in the PAD and provide 10 years of operations data for each Project including: 1) daily impoundment elevations; and 2) daily outflows for each Project (minimum, maximum, and average daily discharge).

Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462
www.brookfieldrenewable.com
Tel: 207.723.4341
Fax: 207.723.3948

**Integrated Licensing Process**

The ILP was established by Commission Order No. 2002 on July 23, 2003 and marked a major reform of hydropower licensing. As noted in the introduction to the rule, the changes created by the ILP "are the culmination of efforts by the Commission, other Federal and state agencies, Indian tribes, licensees, and members of the public to develop a more efficient and timely licensing process, while ensuring that licenses provide appropriate resource protections required by the Federal Power Act (FPA) and other applicable laws." The Commission adopted the ILP following a long and deliberative rulemaking process that addressed comments from the Departments of the Interior and Commerce, as well as Trout Unlimited.

As explained in Order No. 2002, the ILP was established as the default licensing process specifically to address large projects with both complexity of resource issues as well as with a reasonable anticipation of controversy. The ILP and its associated schedule of activities, therefore, was expressly designed to accommodate projects exactly like the Ripogenus and Penobscot Mills Projects. However, GLHA contends that the Ripogenus and Penobscot Mills Projects are by no means exceptional in size or complexity when considered in the context of other hydropower projects licensed by the Commission since the ILP was introduced. Further, 30-year licenses for these Projects were issued on October 22, 1996. The imminent expiration of these licenses has been well known and remarked upon within the state by agencies and NGOs alike.

In preparing for filing the Notices of Intent and PAD on June 11, GLHA carefully considered the most appropriate process for relicensing these Projects before selecting the ILP. GLHA spent considerable resources developing a PAD that was as clear and comprehensive as possible in order to facilitate stakeholder review, and GLHA filed these materials as early as it could in order to ensure the Director's Study Determination would be issued in time to allow for a full 2022 study season.

**Request for Sources**

Regarding the request for the source study information, GLHA's June 11, 2021, PAD meets the applicable regulatory requirements as defined by 18 Code of Federal Regulations (CFR) §5.6(d)(3)(i)(B) by including *"summaries (with reference to sources of information or studies) of existing data or studies regarding the resource.*"

In addition, the Commission's regulations have long recognized the need for stakeholders to have access to key information associated with a licensing process. In an ILP, this access is described at 18 CFR §5.2(a), under "Document Availability," as well as §5.6(c)(2), under "Pre-Application Document." Both sections require GLHA to make available for public review both the PAD itself as well as the "sources of information on the existing environment and known or potential resource impacts." As noted in the Notices of Intent, copies of the PAD are located at the offices of Brookfield Renewable at 150 Main Street, Lewiston, Maine 04240 and 1024 Central Street, Millinocket, Maine 04462. However, COVID-19 restrictions currently limit GLHA's ability to provide in-person public access to these materials.

That said, the ILP regulations contemplate other means to provide stakeholder access to source materials used in development of the PAD. Per §5.6(c)(2), "A potential applicant must provide the requested information within 20 days from receipt of the request." The ILP, therefore, already includes provisions to cover requests exactly like those made by stakeholders for the Ripogenus and Penobscot Mills Projects, including a defined timeline.

GLHA notes that all stakeholders have had since the filing of the PAD on June 11 to request copies of the reports. Nonetheless, and consistent with the Commission's regulations, GLHA anticipates filing electronic versions of the requested study reports with the Commission for access by interested parties within 20 days of the earliest such request, which was received on September 13. Upon filing, GLHA will inform stakeholders of the availability of the documents.

**Information Requests**

Regarding the request for 10 years of operational data for each Project, GLHA's June 11, 2021, PAD meets the applicable regulatory requirements as defined by 18 CFR §5.6(d)(2)(v)(B) by including *"a* summary of project generation and outflow records for the five years preceding filing of the pre-application document."

GLHA believes that the requests for operational data are beyond the intent of 18 CFR §5.6(c)(2) or an Additional Information Request at this stage in the relicensing process. Therefore, GLHA believes that such a request should be the subject of a study request through the Commission's ILP.

**Extension Request**

GLHA does not support the request for a 90-day extension of time for parties to file study requests and to provide comments on the PAD for the following reasons:

- The Projects are being relicensed using the Commission's established ILP, which is designed to provide a predictable, efficient, and timely process for large and complex projects such as the Ripogenus and Penobscot Mills Projects.
- The ILP incorporates numerous opportunities for parties to request information or studies and provide comments, including comments on the Proposed Study Plan and Revised Study Plan. There is nothing unique about these Projects to support the Commission altering the established Process Plan and Schedule.
- GLHA filed the PAD on June 11, 2021, which provides a period of approximately 120 days for participants to review the PAD and then file study requests and comments.
- A 90-day extension in the relicensing process would have detrimental effects on the timing and effectiveness of the subsequent relicensing schedule milestones. For example, the current Process Plan and Schedule results in FERC's issuance of a Study Plan Determination by April 22, 2022, which, although a tight timeframe, provides GLHA with sufficient time to prepare for and perform the first season studies in 2022. If the schedule is delayed by 90 days, FERC's Study Plan Determination would be issued on or about July 21, 2022, which would not allow sufficient time to prepare for and perform field studies in 2022. Therefore, the majority of, if not all, of the first season

studies would be delayed until 2023, with potential second season studies then not performed until 2024. Thus, a 90-day time extension would effectively delay the field study component of these relicensings by a full year, thereby severely limiting the time available to incorporate the study results into the relicensing proceedings. In addition, if any studies were to be required in 2024, the associated study results and reports would not be available to the parties during their review of the Draft License Application, which is to be filed by GLHA on or about May 3, 2024, or at the time of the filing of the Final License Application on or before September 30, 2024.

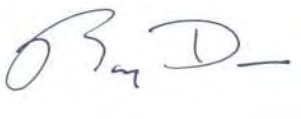
**Additional Scoping Meetings**

Both NMFS and the PIN claim that the Commission should "re-do" the scoping meetings because the format was different from prior scoping sessions. GLHA disagrees and appreciates the Commission's efforts to conduct *any* scoping given the extreme challenges of the COVID-19 pandemic. GLHA notes that up until recently, the Commission has been forced to conduct purely paper scoping that did not afford either Commission staff or the applicant the ability to respond in real-time to stakeholder questions or comments. The PIN asserts that speakers at the public session were somehow disadvantaged by being unable to hear comments made by other speakers. Brookfield notes that, as clearly explained by Commission staff, court reporters recorded all comments provided during the public session and, as with all Commission scoping, transcripts will be available for public review. Finally, Brookfield notes that the period for written comments is still open.

In conclusion, GLHA is committed to expeditiously providing copies of the existing and available study reports for the previously completed studies referenced in the PAD. However, for the reasons outlined above, GLHA does not support the requested 90-day extension of time to file study requests and to provide comments on the PAD. Additionally, GLHA does not support additional scoping meetings at this time.

If you have any questions regarding this information, please contact the undersigned at (207) 775-5605 or randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman
Licensing Manager, Brookfield Renewable

JANET T. MILLS
GOVERNOR

STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
284 STATE STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041

JUDITH CAMUSO
COMMISSIONER

***VIA ELECTRONIC FILING***

September 17, 2021

Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

**RE: Extension of Time Request for the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458)**

Dear Secretary Bose:

On September 10, 2021, Maine Department of Inland Fisheries and Wildlife (MDIFW) staff attended the virtual Scoping Meeting hosted by the Federal Energy Regulatory Commission (FERC) for both the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458). The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot Counties, Maine.

During the meeting, stakeholders noted that, to date, Great Lakes Hydro America, LLC (GLHA; Applicant) had not provided (1) studies referenced in the Pre-Application Document (PAD); or (2) operations data for any of the projects. In the PAD the Applicant states *"…GLHA maintains that a full suite of new studies is not needed, that the vast body of information on which today's certifications and licenses are soundly based and should be relied upon for these relicensings. In addition, consistent with the Commission's criteria for study requests, the scope and extent of any new study be focused on addressing specific data gaps necessary to inform the development of license requirements."*

While broad summaries of the studies performed during the last relicensing were provided in the PAD, a refined synthesis of the data was not, nor were any data gaps identified by the Applicant. Without the original studies, and without operations data for each dam, stakeholders cannot identify existing data gaps to inform their respective Study Requests or their PAD comments. Therefore, our Agency respectfully requests that FERC require the Applicant to provide stakeholders with ten years of operations data for each Project including, but not limited to, daily impoundment elevation and daily outflows for each project (minimum, maximum, and average daily discharge). We also request that FERC require the Applicant to provide stakeholders with each study referenced in the PAD and that the Commission grant a 90-day extension of time, from when studies and operations data is received, to submit PAD comments and Study Requests for the Ripogenus and Penobscot Mills relicensing proceeding.

PHONE: (207) 287-5254 FISH AND WILDLIFE ON THE WEB: www.maine.gov/ifw EMAIL ADDRESS: IFWEnvironmentalreview@maine.gov

Thank you, and please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,



John Perry
Environmental Review Coordinator

Cc: Francis Brautigam, Joe Overlock--MDIFW Fisheries Division, Augusta Headquarters
Tim Peabody, Deputy Commissioner MDIFW
Tim Obrey, Kevin Dunham—MDIFW Regional Fisheries Division
Doug Kane, Mark Caron—MDIFW Regional Wildlife Division
Beth Swartz, Shevenell Webb, Danielle D'Auria, Derek Yorks—MDIFW WRAS
Gail Wippelhauser, Casey Clark, MDMR
Kathy Howatt, Christopher Sferra—MDEP
Julianne Rosset, USFWS
Jeff Murphy, NMFS

Benjamin Koehler, Orono, ME.
Hello, I am writing today to express to FERC my desire for there to be a flow study ordered for Dryway section of the West Branch of the Penobscot (Upstream of McKay Station), and the Backbend (A de watered section downstream of Quakish Lake, upstream of Dolby Pond.  Both of these sections contain quality whitewater recreation, but are not given any recreational flow under current operation of the Ripogenus Hydroelectric Projects.  I believe there the new FERC license should include recreational releases on these sections to better support the betterment of Maine peoples quality of life thru recreation, and to stimulate our struggling local economy.

Thank you
-Benjamin Koehler

Joshua Firmin, Brewer, ME.
Regarding the selected dockets, I am writing to request flow studies to evaluate recreational opportunities.

Thank you.

Tom S Janelle, Falmouth, ME.
Ripogenus Hydroelectric Project nos. P-2572-133.  Docket Number P-2572 Sub Docket - 133

I am writing to voice concerns regarding the water levels and safe, reliable recreational access to Caribou, Chesuncook and Ripogeneous Lakes.  The draw down that occurs on these lakes has made it unsafe to launch boats from both the Caribou Lake put in and the Chesuncook Boat Launch.  My family owns a camp on Caribou Lake ( T3, R12) and we have been unable to safely access the lake from our camp all summer due to these consistent draw downs. Our access to the lake for swimming, fishing and boating/kayaking has been dangerous due to the exceptionally low water levels.

I am also concerned about the ecological impact these large and consistent draw downs have on the water quality of Caribou Lake. the changes that I am seeing to the shoreline of Caribou Lake is disturbing. Plant and tree growth in areas where it should not be happening because of low water levels.  I am worried that without stable water levels these changes will have lasting and profound impact on the wildlife in the area.

I wish to advocate for minimum, stable lake levels with a maximum 1.5 feet draw down from ice out through early September.  This would assure reliable and safe access to the lake for camp owners and the public.  This draw down of 1.5 feet during the summer months is similar to the other lakes in the region, namely the North Twin Development.

Tom Janelle
email - tjanelle@maine.rr.com
41 Hadlock Rd.
Falmouth, Maine 04105
207 239 6229

Alec Jansujwicz, Bangor, ME.
I am writing to express my interest in a flow study on the Dryway above McKay station and the Backbend sections of the West Branch. As a whitewater paddler, I hope that the recreational opportunity of the Dryway is realized and flows be determined. While Gorge-Crib is one of the best runs in the East, having the extra milage of the Dryway would allow paddlers to experience an entirely new and amazing section of whitewater. Thanks!

Karl Koehler, Orono, ME.
I request flow study on the Dryway and Backbend sections of the West Branch of the Penobscott River.

Brookfield Renewable

September 24, 2021

***Via Electronic Filing***

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Supplemental Information – Source Information and Existing Studies**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), a subsidiary of Brookfield Renewable and Licensee of the Ripogenus Hydroelectric Project and Penobscot Mills Hydroelectric Project (collectively referred to as the "Projects"), herein files a summary of the source information and existing studies that GLHA is uploading to the Federal Energy Regulatory Commission's ("FERC" or "Commission") eLibrary system. The documentation being uploaded by GLHA provides the source information and available reports for each previously completed study as referenced in the Pre-Application Document (PAD). As indicated in the letter filed with FERC by GLHA on September 17, 2021, GLHA is uploading this information in accordance with 18 Code of Federal Regulations (CFR) §5.6(c)(2) and in response to the stakeholder requests listed below.

- National Marine Fisheries Service letter filed September 13, 2021
- U.S. Fish and Wildlife Service letter filed September 14, 2021
- Maine Council of Trout Unlimited letter filed September 16, 2021
- Penobscot Indian Nation letter filed September 16, 2021
- Maine Department of Marine Resources letter filed September 17, 2021
- Maine Department of Inland Fish and Wildlife letter filed September 17, 2021

On June 11, 2021, GLHA filed the Notices of Intent and PAD, which initiated the relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through the Commission's Integrated Licensing Process (ILP). Based on the ILP regulations and the Process Plan and Schedule provided in the PAD, FERC issued Scoping Document 1 on August 10, 2021, and subsequently conducted daytime and evening virtual Scoping Meetings on September 9, 2021. Additionally, during the afternoon of September 9, 2021, GLHA hosted a virtual environmental site review, which provided stakeholders with an overview of the Projects utilizing drone video, photographs, and PowerPoint slides. Open question-and-answer sessions were held during FERC's daytime scoping meeting, as well as following the Project overview during the virtual site review.

This letter provides a roadmap of the milestones associated with the previous relicensing of the Projects, as well as the documents that contain copies of the source information and study reports of the previously completed studies. Parties with interest in the requested source information and study reports can download an electronic copy of these documents from FERC's eLibrary system at

Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462
www.brookfieldrenewable.com
Tel: 207.723.4341
Fax: 207.723.3948

https://www.ferc.gov/docs-filing/elibrary.asp by conducting a search using the docket numbers P-2458 and/or P-2572.

## Previous Relicensing Process Milestones

The information provided in the table below indicates primary milestones associated with the previous relicensing of the Projects and is a reference point to the existing information available for these Projects, including studies performed by the Licensee in support of the 1991 License Applications, as well as in response to requests for additional information subsequent to the 1991 filing.

| Date | Milestone |
|---|---|
| 1968 | FERC issued original licenses to Projects, which expired on 12/31/1993. |
| Dec 17, 1991 | Licensee filed separate License Applications for Projects (Volumes I – XII)*. |
| Jun 8, 1992 | FERC issued request for additional information. |
| Jul 1, 1992 | FERC issued amendment to (6/8/1992) request for additional information. |
| Dec 7, 1992 | Licensee filed response to FERC's (6/8/1992) request for additional information (Volume XIII)*. |
| Mar 25, 1993 | FERC issued Notice of Applications Ready for Environmental Analysis. |
| Apr 22-23, 1993 | State of Maine issued Water Quality Certificates for Projects. |
| May 1993 | Agencies and Intervenors filed comments. |
| Jul 8, 1993 | Licensee filed responses to (May 1993) comments filed by Agencies and Intervenors (Volume XIV)*. |
| Oct 28, 1993 | FERC issued request for additional information. |
| Nov 29, 1993 | Licensee filed responses to FERC's (10/28/1993) request for additional information (Volume XV)*. |
| Dec 31, 1993 | Original licenses expired; FERC issued annual licenses until new licenses were issued in 1996. |
| Jan 14, 1994 | FERC issued request for additional information. |
| Feb 14, 1994 | Licensee filed response to FERC's (1/14/1994) request for additional information*. |
| Apr 5, 1994 | Licensee filed refinement to responses previously filed on 11/29/1993 and 2/14/1994*. |
| Dec 1, 1994 | FERC issued Draft Environmental Impact Statement (EIS) for Projects. |
| Jan 25, 1995 | FERC held public hearing in Millinocket, ME. |
| Feb 22, 1995 | Licensee and stakeholders filed comments on Draft EIS. |
| Mar 17, 1995 | Licensee filed response to comments on Draft EIS filed by Agencies and Intervenors*. |
| Oct 1, 1996 | FERC issued Final EIS. |
| Oct 22, 1996 | FERC issued new licenses for Projects. |

*Documents eFiled with FERC as part of this submittal.

## Summary of Studies Performed to Date for Ripogenus Project

The information provided in the table below is a summary of the studies and monitoring performed at the Ripogenus Project prior to the previous relicensing, during the previous relicensing, or after issuance of the new license in 1996. This table also describes the location of where this information can be found, the majority of which is being filed with FERC as part of this submittal or is otherwise readily available on FERC's eLibrary.

| Resource | Study | Date | Comments | Location of Information |
|---|---|---|---|---|
| **Water Quality and Quantity** | Water Quality Study | 1977, 1978, 1980 | Pre-relicensing studies. | Summary of results provided in Ripogenus License Application, Vol 2. |
| | Water Quality Study | 1981 | Pre-relicensing studies. | Summary of results provided in Ripogenus License Application, Vol 2. |
| | Water Quality Study | 1982, 1983, 1984 | Additional pre-relicensing studies to compliment previous studies. | Summary of results provided in Ripogenus License Application, Vol 2. |
| | Water Quality Study | 1986, 1987 | Two complete years of data collected in Upper Gorge, McKay Station Tailrace, Ripogenus Lake, Caribou Lake, Ragged Lake Stream (inlet to Caribou Lake), Chesuncook Lake (3 locations), West Branch (inlet to Chesuncook Lake), Caucomgomoc Stream flowage/Black and Brand Ponds. | Summary of results provided in Ripogenus License Application, Vol 2 with data provided in Appendix E2 II-1 (Vol 7). |
| | Water Quality Study | 1988 | Less extensive study to supplement 1986-1987 studies with data collected at McKay Station Tailrace, Ripogenus Lake, Caribou Lake, and Chesuncook Lake (2 locations). | Summary of results provided in Ripogenus License Application, Vol 2 with data provided in Appendix E2 II-2 (Vol 7). |
| | Water Quality Modeling Evaluation of Downstream Impacts Associated with Run-of-River Flow Management | 1991 | Evaluation of water quality (dissolved oxygen) implications of changing the existing West Branch storage projects to run-of-river operation through use of Qual2E model for riverine systems. | Summary of results provided in Ripogenus License Application, Vol 2 with study report contained in Appendix E2-V-3 (Vol 7). |
| | VLMP Water Quality Monitoring in Chesuncook Lake | 2001 | Water quality data collected by Volunteer Lake Monitoring Program. | Publicly available data via: https://www.lakesofmaine.org/lake-water-quality.html?m=0662 |
| | Derivation of 7Q10 Value for West Branch | 1987 | Study conducted by Kleinschmidt Associates. | Summary of results provided in Ripogenus License Application, Vol 2 with study report contained in Appendix E2-V-1 (Vol 7). |
| | Natural Inflow Study in Penobscot River Basin Upstream of East Millinocket Dam | 1990 | Study performed by Stone & Webster Engineering Corporation, which examines the natural inflow into the Projects in support of assessing the impacts of the consequences of an operational change that would eliminate the drawdown of the Project's impoundments. | Summary of results provided in Ripogenus License Application, Vol 2 with study report contained in Appendix E2-V-2 (Vol 7). |
| | Water Use Plan Modeling | 1991 | Licensee developed the Water Use Plan, which was a model of its entire system to determine whether Project operations could be adjusted to satisfy agency mitigation/enhancement requests. | Summary of results provided in Ripogenus License Application, Vol 2 with study report contained in Appendix E2-V-3 (Vol 7). |
| | Use Attainability Analysis | 1992 | MDEP Use Attainability Analysis to support the change in classification of the Ripogenus Impoundment. | UAA provided in 47-page letter dated October 26, 1992 from MDEP to USEPA. |

| Resource | Study | Date | Comments | Location of Information |
|---|---|---|---|---|
| **Aquatic Resources** | Aquatic Community Study | 1981, 1982, 1984, 1986, 1987 | Reports on Periphyon, Phytoplankton, Zooplankton, and Benthic Macroinvertebrates in the Ripogenus Project area. | Summary of results provided in Ripogenus License Application, Vol 2 with study reports contained in Appendix E3.1 V-1 (Vol 8). |
| | 1990 Report on Studies of the Habitat, Fish Populations, and Fisheries of the Ripogenus Project | Various | Report summarizes results the studies listed below:<br>• 1960 MDIFW Chesuncook Lake Survey<br>• 1986 MDIFW Chesuncook Lake Progress Report No. 1<br>• Study Area Stocking Records<br>• 1978-1989 Summary of Individual River Section Creel Census Data in West Branch (McKay Station to Ambajejus Lake)<br>• 1984-1989 Estimates of Smelt Drift at Holbrook Pool and Horserace in West Branch<br>• 1989 Upper Gorge Habitat Base Flow Study | Summary of results provided in Ripogenus License Application, Vol 2 and Appendix E3.1 V-1 (Vol 9) with study reports for supporting studies provided in Appendix E3.1 V-2 (Vol 10) |
| | Smelt Access to Spawning Streams (14) | 1987, 1988 | Evaluation of rainbow smelt access to potential spawning tributaries in Ripogenus impoundment. | A summary of the results is provided in Ripogenus License Application, Vol 2 and detailed descriptions are provided in Appendix E3.1-V-1 and E3.1-V2 *Report on Fish Resources* (Vol 9 and 10). |
| | Angler Creel Census | 1987, 1988 | GHLA completed interviews by boat, at boat launches, or at camps to estimate angling use, catch, and harvest. | A summary of the results is provided in Ripogenus License Application, Vol 2 and detailed descriptions are provided in Appendix E3.1-V-1 and E3.1-V2 *Report on Fish Resources* (Vol 9 and 10). |
| | MDIFW Winter Creel Census | 1986 | Intensive creel surveys completed by MDIFW in response to increased angling pressure. | A summary of the results is provided in Ripogenus License Application, Vol 2 and detailed descriptions are provided in Appendix E3.1-V-1 and E3.1-V2 *Report on Fish Resources* (Vol 9 and 10). |
| | Fisheries Study in 19 Tributaries to Ripogenus Impoundment | 1986-1989 | Electrofishing, salmon redd surveys, trap-net surveys, and habitat assessments to document baseline conditions in 19 tributaries to Ripogenus Lake. | A summary of the results is provided in Ripogenus License Application, Vol 2 and detailed descriptions are provided in Appendix E3.1-V-1 and E3.1-V2 *Report on Fish Resources* (Vol 9 and 10). |
| | Holbrook Side Channel Baseline Fishery Survey | 1997-1998 | Baseline monitoring performed prior to modification of side channel. | FERC eLibrary (filed 12/31/1998). |

| Resource | Study | Date | Comments | Location of Information |
|---|---|---|---|---|
| | Holbrook Side Channel Improvement Monitoring and Reporting | 1998, 1999, 2000, 2001, 2002 | Modifications completed in Sep 1998. Monitoring performed and reported to FERC. | FERC eLibrary (filed 12/28/1999, 1/8/2001, 1/15/2002, 1/23/2003). |
| | Mercury Monitoring | 1997-1998 | Sediment and water samples were collected from Chesuncook Lake, Lower Dolby Pond, and Seboeis Lake and analyzed for mercury. Fish were collected at Chesuncook and Seboeis Lakes, North Twin impoundment, and the West Branch (downstream of Ripogenus Dam) and analyzed for mercury. Fish previously collected from Dolby Pond and Lobster Lake and analyzed for mercury were included in this study. | FERC eLibrary (filed 6/1/1999). |
| **Wildlife, Botanical, Wetlands** | Botanical Resource Assessment | 1981 | Pre-relicensing study of 4-mile section of West Branch and T-line corridor from McKay Station to Millinocket. | Summary of results provided in Ripogenus License Application, Vol 2. |
| | Botanical and Wildlife Resource Assessment | 1986, 1987, 1989, 1991 | Study area includes Ripogenus impoundment, Upper Gorge, 21-mile-long segment of West Branch, and 30-mile-long transmission corridor from McKay Station to Millinocket. | Summary of results provided in Ripogenus License Application, Vol 2 with study data in Vol 10. |
| | Wetland Enhancement Assessment | 1992 | Study performed in response to June 8, 1992 FERC AIR #6. Study identified possible wetland enhancement sites: north end of impoundment on Black Pond and at mouth of Quaker Brook. | Study report/results filed in Licensee's December 7, 1992 Response to AIRs (Vol 13 of Ripogenus License Application). |
| | Observation of Wildlife Habitat Value of West Branch Deadwater Wetlands under Existing and Unmanaged Flow Conditions | 1992 | Study performed in response to June 8, 1992 FERC AIR #6. | Study report/results filed in Licensee's December 7, 1992 Response to AIRs (Vol 13 of Ripogenus License Application). |
| | Umbazooksus Lake Wetland Enhancement Monitoring and Reporting | 1998, 2000, 2002, 2004 | Baseline monitoring performed in 1998 prior to wetland enhancement measures at Umbazooksus Lake. Monitoring and reporting performed in 2000, 2002, and 2004 to evaluate wetland enhancement measures. | FERC eLibrary (filed 6/3/1999, 6/4/2001, 6/13/2003, 6/20/2003, 6/1/2005). |
| | Loon Nesting Annual Monitoring and Reporting | 1998 through 2010 | Artificial nesting platforms deployed annually through license term; monitoring and reporting conducted annually from 1998-2010. | FERC eLibrary (Final Annual Report filed on 10/19/2010). |
| **Recreation** | Recreation Facility Inventory | ~1990 | Study data provides detailed information about Project and non-Project recreation facilities in vicinity of Ripogenus Project. | Summary of results provided in Ripogenus License Application, Vol 3 with study data provided in Appendix E5-II (Vol 11). |
| | Whitewater Boating and | 1990 | Surveys performed along West Branch downstream of McKay | Summary of results provided in Ripogenus License Application, |

| Resource | Study | Date | Comments | Location of Information |
|---|---|---|---|---|
| | Angling Use Survey | | Station from June through September 1990. | Vol 3 with study data provided in Appendix E5-V (Vol 11). |
| | Whitewater Boating Additional Information | 1992 | Response to June 8, 1992 FERC AIR #17 and 18 providing additional information related to requested and licensee-proposed whitewater boating flows. | Summary of results provided in Licensee's December 7, 1992 Response to AIRs (Vol 13 of Ripogenus License Application). |
| | Recreation Use and Needs Monitoring and Reporting | 2001, 2008, 2014 | Monitoring was performed May thru Sep every 6 years at Project boat launches and picnic areas. MDOC provided use data on campsites managed by MDOC. | FERC eLibrary (filed 10/24/2002, 1/29/2009, 4/28/2015). |
| **Cultural** | Phase 0 Cultural Resource Assessment | 1988 | | Study report provided in Ripogenus License Application, Vol 12 (Non-public information). |
| | Archaeological Phase I Survey and Phase II Testing | 1989, Supplemented 1991 | | Study reports provided in Ripogenus License Application, Vol 12 (Non-public information). |
| | Phase III Mitigation Activities and Annual Reporting | 1998 through current | Reports filed annually in October with FERC. | FERC eLibrary (Non-public information). |
| **Visual** | Visual Resources Study | 1990 | Study performed by Dewan and Associates that describes and analyzes visual resources and activities within the Ripogenus Project study area. | Summary of results provided in Ripogenus License Application, Vol 3 with study data provided in Appendix E6-V (Vol 11). |

## Description of 1991 License Application for Ripogenus Project

The information in the table below provides a detailed overview of the contents of the Ripogenus Project License Application filed in December 1991 as well as subsequent filings by the Licensee providing responses to additional information requests by FERC and comments from stakeholders. The documents listed in the table below are being filed with FERC as part of this submittal, unless otherwise indicated. Additionally, as noted in the table below, some of these documents are considered non-public as they contain Controlled Unclassified Information (CUI) as either Privileged Information or Critical Electric/Energy Infrastructure Information (CEII) and are filed as such as part of this submittal.

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|---|---|---|
| I | Exhibit A | Project Description |
| | Exhibit B | Project Operation and Resource Utilization |
| | Exhibit C | Construction History |
| | Exhibit D | Project Costs |
| | Exhibit F | Project Works Drawings (CEII / Non-Public Information) (see Vol IV) |
| | Exhibit G | Project Boundary Drawings |
| II | Exhibit E | Environmental Report |
| | Section 1.0 | General Description of Locale |
| | Section 2.0 | Report on Water Use and Quality |
| | Section 3.1 | Report of Fish Resources |

| Volume No. | Content | Description |
|---|---|---|
| | Section 3.2 | Report on Botanical Resources |
| | Section 3.3 | Report on Wildlife Resources |
| III | Exhibit E | Environmental Report |
| | Section 4.0 | Report on Historical/Archaeological Resources |
| | Section 5.0 | Report on Recreational Resources |
| | Section 6.0 | Report on Land Management and Aesthetics |
| | Section 7.0 | Summary of Agency Consultation |
| IV | Exhibit F | Supporting Design Report (CEII / Non-Public Information) |
| V | Exhibit H | Description of Project Management and Need for Power |
| VI | Appendix | Agency and Public Correspondence (Not included in this submittal) |
| VII | Appendix | Report on Water Use and Quality |
| | E2-I | 1986-1988 Water Quality Study Methodology |
| | E2-II-1 | 1986-1987 Water Quality Study Data |
| | E2-II-2 | 1988 Water Quality Data |
| | E2-III | Water Quality Study Consultation Correspondence (Vol VI) |
| | E2-IV | Water Quality Study Literature Citations |
| | E2-V-1 | 1987 Study Report for Derivation of 7Q10 Value for West Branch |
| | E2-V-2 | 1990 Study Report for Natural Inflow Study in Penobscot River Basin Upstream of East Millinocket Dam |
| | E2-V-3 | Water Quality Modeling Evaluation of Downstream Impacts Associated with Run-of-River Flow Management |
| | E2-V-4 | Water Use Plan for Ripogenus and Penobscot Mills Projects |
| VIII | Appendix | Report on Fish Resources |
| | | 1990 Report on Study of Aquatic Communities |
| IX | Appendix | Report on Fish Resources |
| | E3.1-V-1 | 1990 Report on Studies of the Habitat, Fish Populations, and Fisheries of the Ripogenus Project |
| X | Appendix | Report on Fish Resources |
| | E3.1-V-2 | Appendices for 1990 Report on Studies of the Habitat, Fish Populations, and Fisheries of the Ripogenus Project |
| | A | 1960 MDIFW Chesuncook Lake Survey |
| | B | 1953-1985 Ripogenus Impoundment Historical Water Level Data |
| | C | 1986 MDIFW Chesuncook Lake Progress Report #1 |
| | D | Study Area Stocking Records |
| | E | 1978-1989 Summary of Individual River Section Creel Census Data West Branch (McKay Station to Ambajejus Lake) |
| | F | 1984-1989 Estimates of Smelt Drift at Holbrook Pool and the Horserace West Branch |
| | G | 1972-1985 Daily Flows in West Branch below McKay Station |
| | H | 1976-1985 Natural Inflow vs Historical Outflow at Ripogenus Dam |
| | I | 1989 Results of Habitat Based Flow Study for Ripogenus Upper Gorge |
| | Appendix | Report on Botanical Resources |
| | E3.2-II | Botanical Data |
| | E3.2-III | Consultation Correspondence |
| | Appendix | Report on Wildlife Resources |
| | E3.3-II | Wildlife Data |
| | E3.3-III | Consultation Correspondence |

| Volume No. | Content | Description |
|---|---|---|
| | E3.3-IV | Literature Cited |
| XI | Appendix | Report on Historical/Archaeological Resources |
| | | Report on Recreational Resources |
| | E5-II | Recreation Data Facility Inventory |
| | E5-III | Consultation Correspondence (see Volume VI) |
| | E5-IV | Literature Cited |
| | E5-V | 1991 Report Summarizing Survey Results for Recreational Activities in the West Branch |
| | Appendix | Report on Land Management and Aesthetics |
| | E6-II | Land Management Data – MLURC Land Use Standards |
| | E6-III | Consultation Correspondence (Volume VI) |
| | E6-V | 1990 Study Report on Visual Resources |
| XII | Appendix | Archaeology – Correspondence and Reports (Privileged / Non-public Information) |
| | Section 1 | Agency Consultation |
| | Section 2 | Reports |
| | | 1988 Phase "0" Cultural Resources Assessment of the Ripogenus Project |
| | | 1991 Supplemental Archaeological Phase II Testing of the Ripogenus Project |
| | | 1991 Archaeological Phase I and II Testing of the Ripogenus Project (Revised from Feb 9, 1990) |
| XIII | Response to AIRs | Licensee response to FERC's June 8, 1992 AIRs (Ripogenus Only) |
| | AIR #1 | Use of Herbicides in the Transmission Corridor |
| | AIR #4 | Instream Flow Study Below McKay Station |
| | AIR #6 | Potential for Wetland Enhancement |
| | AIR #9 | Cultural Resources Management Plan (Privileged / Non-public Information) |
| | AIR #10 | Details of Eligibility of Ripogenus Dam for National Register |
| | AIR #11 | Information on Future Sites for Recreation Development |
| | AIR #12 | Derivation of Access Fees to Non-Project Lands |
| | AIR #13 | Recreational Use of Non-Project Lands |
| | AIR #14 | McKay Station Use Fee |
| | AIR #15 | Photos of Ripogenus Dam and Upper Gorge |
| | AIR #16 | Copy of the Resource Protection Plan and Conservation Easement |
| | AIR #17 | Additional Information regarding Whitewater Boating Flows |
| | AIR #18 | Whitewater Flow Video (Not included in this submittal) |
| | AIR #20 | The Effect of Impoundment Levels on Boat Docks |
| | AIR #26 | Needs of the Disabled |
| | AIR #27 | Upstream Impoundments |
| | AIR #28 | Miscellaneous Consultation |
| XIV | Response to Comments by Agencies and Intervenors | Licensee response to Comments by Agencies and Intervenors for Ripogenus and Penobscot Mills Projects |
| | | Penobscot Indian Nation Claims to Islands in West Branch |
| | | Water Quality |
| | | Mercury Bioaccumulation – Water Quality |
| | | Mercury Bioaccumulation – Endangered Species |
| | | Millinocket Stream Minimum Flows |
| | | Fish Passage |
| | | Upper Gorge Minimum Flows |

| Volume No. | Content | Description |
|---|---|---|
| | | Minimum Flows below McKay Station |
| | | Minimum Flows in Back Channel |
| | | Impoundment Operations – Drawdown Limitations |
| | | Impoundment Operations – Run-of-River |
| | | Use of Herbicides on Transmission Line Rights-of-Way |
| | | Water Use Plan |
| | | Recreation Issues |
| | | Comprehensive Water Basin Issues |
| | | Buffer Zones |
| | | Energy Conservation |
| | | Power Generation Alternatives |
| | | Mill Economics and Employment |
| | | Response to Specific Agency and Indian Tribe Recommendations |
| | | Conclusion |
| XV | Response to AIRs | Licensee response to FERC's October 28, 1993 AIRs |
| | AIR #1 | Water Use Plan Model – Supporting Documentation |
| | AIR #2 | Wetlands Enhancements – Additional Supporting Information |
| | AIR #3 | Back Channel IFIM – Additional Information |
| | AIR #4 | Evaluation of Generating Facilities at Stone Dam |
| | AIR #5 | Evaluation of Economic Impact of Change in Operations |
| -- | Feb 14, 1994 | Licensee response to FERC's (1/14/1994) request for additional information |
| | 1 | Flow Impacts (Upper Gorge; Outage Flows, Whitewater Flows, Spawning Flows; Millinocket Stream) |
| | 2 | Spreadsheet Results for Driest and Worst Case "Typical" Year |
| | 3 | Spreadsheet Results Showing Effect on Impoundment Elevations and Minimum Flows for Average, Driest, Wettest, and "Typical" Years |
| | 4 | Average Annual Costs for flows in Upper Gorge, Millinocket Stream, and Back Channel |
| -- | Apr 5, 1994 | Licensee refinement to 11/29/1993 and 2/14/1994 responses |
| -- | Mar 17, 1995 | Licensee response to (2/22/1995) comments on Draft EIS |

## Summary of Studies Performed to Date for Penobscot Mills Project

The information provided in the table below is a summary of the studies and monitoring performed at the Penobscot Mills Project prior to the previous relicensing, during the previous relicensing, or after issuance of the new license in 1996. This table also describes the location of where this information can be found, the majority of which is being filed with FERC as part of this submittal or is otherwise readily available on FERC's eLibrary.

| Resource | Study | Date | Comments | Location of Information |
|---|---|---|---|---|
| **Water Resources** | Water Quality Study | 1981 – 1985 | Licensee performed annual summer river surveys related to their licensed wastewater discharges and performed water quality measurements in support of biomonitoring studies. | Summary of results provided in Penobscot Mills License Application, Vol 2. |

| Resource | Study | Date | Comments | Location of Information |
|---|---|---|---|---|
| | MDEP Water Quality Study | 1984-1985 | MDEP performed water quality measurements as part of effluent discharge modeling efforts. | Summary of results provided in Penobscot Mills License Application, Vol 2 with the study report provided in Appendix E2-V-3 (Vol 7). |
| | Water Quality Study | 1986, 1987 | Licensee performed two complete years of data collection in all major impoundment/lake basins and tailrace waters (total of 17 locations). | Summary of results provided in Penobscot Mills License Application, Vol 2 with data provided in Appendix E2 II-1 (Vol 7). |
| | Water Quality Study | 1988 | Licensee performed less extensive study to supplement 1986-1987 studies with data collected at a total of 12 locations. | Summary of results provided in Penobscot Mills License Application, Vol 2 with data provided in Appendix E2 II-1 (Vol 7). |
| | MDEP West Branch Penobscot Waste Load Allocation | 1987 | Evaluation of water quality impacts from industrial and municipal point sources and historic accumulations of sludge in impoundments through use of Qual2E model for riverine systems. | Summary of results provided in Penobscot Mills License Application, Vol 2 with study report contained in Appendix E2-V-3 (Vol 7). |
| | Derivation of 7Q10 Value for West Branch | 1987 | Study conducted by Kleinschmidt Associates. | Summary of results provided in Penobscot Mills License Application, Vol 2 with study report contained in Appendix E2-V-1 (Vol 7). |
| | Water Quality Modeling Evaluation of Downstream Impacts Associated with Run-of-River Flow Management | 1991 | Evaluation of water quality (dissolved oxygen) implications of changing the existing West Branch storage projects to run-of-river operation through use of Qual2E model for riverine systems. | Summary of results provided in Penobscot Mills License Application, Vol 2 with study report contained in Appendix E2-V-4 (Vol 7). |
| | Natural Inflow Study in Penobscot River Basin Upstream of East Millinocket Dam | 1990 | Study performed by Stone & Webster Engineering Corporation, which examines the natural inflow into the Projects in support of assessing the impacts of the consequences of an operational change that would eliminate the drawdown of the Project's impoundments. | Summary of results provided in Penobscot Mills License Application, Vol 2 with study report contained in Appendix E2-V-2 (Vol 7). |
| | Water Use Plan Modeling | 1991 | Licensee developed the Water Use Plan, which was a model of its entire system to determine whether Project operations could be adjusted to satisfy agency mitigation/enhancement requests. | Summary of results provided in Penobscot Mills License Application, Vol 2 with study report contained in Appendix E2-V-5 (Vol 7). |
| | Water Quality Assessment of Back Channel | 1992 | Conducted in response to FERC's June 8, 1992 AIR. | Study results provided in Licensee's December 7, 1992 response to AIRs (Vol 13 of Penobscot Mills License Application). |
| | PIN Water Quality Studies | 2012-2019 | Water quality data collected in the West Branch Penobscot River by the Penobscot Indian Nation. | Publicly available data via: https://www.waterqualitydata.us/provider/STORET/ |

| Resource | Study | Date | Comments | Location of Information |
|---|---|---|---|---|
| | | | | PENOBSCOTINDIANNATIONDNR/ |
| | VLMP Water Quality Monitoring in North Twin and Millinocket Lake Storage Impoundments | 2007-2011 | Water quality data collected by Volunteer Lake Monitoring Program. | Publicly available data via: https://www.lakesofmaine.org/ data/2018_Lake_Reports/982_6.html<br><br>https://www.lakesofmaine.org/ data/2018_Lake_Reports/2020_1.html |
| | MDEP Water Quality Study of West Branch and Penobscot River | 2007 | Water quality study conducted by MDEP in West Branch and main stem Penobscot River for calibration and verification of a water quality model. | Publicly available data via: https://www.maine.gov/dep/water/ monitoring/rivers_and_streams/ modelinganddatareports/index.html. |
| | MDEP Biological Monitoring Program Benthic Macroinvertebrate Data | 1984, 1987, 1995, 1996, 2000, 2001, 2006, 2011, 2017 | Benthic macroinvertebrate sampling results from the West Branch and Millinocket Stream. | Publicly available data via: https://www1.maine.gov/ dep/water/monitoring/ biomonitoring/data.html. |
| **Aquatic Resources** | Report on Studies of Aquatic Communities | 1986-1987 | Study performed by Normandeau Associates. Samples collected during ice-free period from North Twin impoundment, Millinocket Lake, Quakish Lake, Dolby Pond, Millinocket Stream, and Back Channel to characterize existing aquatic communities. | Summary of results provided in Penobscot Mills License application, Vol 2 with study report contained in Appendix in Vol 8. |
| | Instream Flow Studies | 1987-1988 | Instream flow studies performed by Normandeau Associates in the Back Channel and Millinocket Stream to determine the minimum flows necessary to maintain aquatic habitat in these two streams. | Study results provided in August 1989 Study Report provided in Appendix Q of Appendix E3.1-V-2 in Vol 10 of Penobscot Mills License Application. |
| | Mercury in Surface Water, Sediment, and Fish from Selected Lakes of Northern Maine | 1992 | Study report prepared by Environmental Science and Engineering, Inc. in response to June 8, 1992 FERC AIR #8. | Study results provided in Licensee's December 7, 1992 Response to AIRs (Vol 13 of Penobscot Mills License Application). |
| | Mercury Monitoring | 1997-1998 | Sediment and water samples were collected from Chesuncook Lake, Lower Dolby Pond, and Seboeis Lake and analyzed for mercury. Fish were collected at Chesuncook and Seboeis Lakes, North Twin impoundment, and the West Branch (downstream of Ripogenus Dam) and analyzed for mercury. Fish previously collected from Dolby Pond and Lobster Lake and analyzed for mercury were included in this study. | FERC eLibrary (filed 6/1/1999). |
| | Millinocket Stream Brook Trout Stocking | Annually 1998-2002 | Annual monitoring and reporting for evaluating the brook trout stocking program in Millinocket Stream. | FERC eLibrary (filed 2/5/1999, 2/3/2000, 2/8/2001, 2/14/2002, 1/29/2003). |

| Resource | Study | Date | Comments | Location of Information |
|---|---|---|---|---|
| | Program Monitoring | | | |
| | North Twin Impoundment Lake Trout Reproduction Monitoring | Biannually from 2000-2010 | Biannual monitoring and reporting to evaluate the reproductive success of lake trout in the impoundment resulting from stable lake elevations. | FERC eLibrary (filed 1/26/2001, 1/28/2003, 1/26/2005, 2/2/2007, 2/4/2009, 1/27/2011). |
| **Wildlife, Botanical, Wetlands** | Botanical and Wildlife Assessment | | Botanical investigations of North Twin impoundment, Quakish Lake, Ferguson Pond, Dolby Pond, East Millinocket impoundment, Millinocket Lake Storage impoundment, Millinocket Stream, segments of the West Branch, Back Channel, and transmission line corridors. Investigations were designed to characterize existing vegetation and wildlife and shoreline environments to evaluate effects of annual drawdowns in water level of the two storage impoundments. | Summary of results provided in Penobscot Mills License Application, Vol 2 with study report provided in Appendix E3.2-II and E3.3-II (Vol 10). |
| | Wildlife Management Plan for Back Channel | 1991 | Report prepared by Normandeau Associations to outline existing wildlife habitat conditions in the Back Channel area and wildlife management practices that may be used to increase the value of the area to wildlife. | Summary of results provided in Penobscot Mills License Application, Vol 2 with study report provided in Appendix E3.3-V (Vol 10). |
| | Wildlife Management Area Monitoring | Annual monitoring with reports filed every 5 years | Monitoring reports filed with the Commission wildlife monitoring reports every 5 years through 2018. | eLibrary (filed 2/8/2000, 2/7/2003, 2/12/2008, 2/12/2013, 2/12/2018). |
| | Wetland Enhancement Assessment | 1992 | Study performed in response to June 8, 1992 FERC AIR #6. Study identified possible wetland enhancement sites at the North Twin impoundment and Millinocket Lake Storage impoundment. | Study report/results filed in Licensee's December 7, 1992 Response to AIRs (Vol 13 of Penobscot Mills License Application). |
| | Observation of Wildlife Habitat Value of West Branch Deadwater Wetlands under Existing and Unmanaged Flow Conditions | 1992 | Study performed in response to June 8, 1992 FERC AIR #6. | Study report/results filed in Licensee's December 7, 1992 Response to AIRs (Vol 13 of Penobscot Mills License Application). |
| | Loon Nesting Annual Monitoring and Reporting | 1998 through 2010 | Annual platform deployment and monitoring from 1998-2010 indicated loons were reproducing naturally at Millinocket Lake Storage impoundment; Platform | FERC eLibrary (Final Annual Report filed on 10/19/2010). |

| Resource | Study | Date | Comments | Location of Information |
|---|---|---|---|---|
| | | | deployment and monitoring ceased in 2010. | |
| **Recreation** | Recreation Use Survey | 1986, 1987 | Study provides information about how different user groups utilize the project impoundments and recreation areas. | Summary of results provided in Penobscot Mills License Application, Vol 3 with copies of survey forms used in Appendix E5-II (Vol 11). |
| | Recreation Facility Inventory | ~1990 | Study data provides detailed information about Project and non-Project recreation facilities in vicinity of Penobscot Mills Project. | Summary of results provided in Penobscot Mills License Application, Vol 3 with study data provided in Appendix E5-II (Vol 11). |
| | Recreation Facility Inventory Supplemental Information | 1992 | Information provided in response to FERC's June 8, 1992 AIRs #19, 20, 21. | Results provided in Licensee's December 7, 1992 Response to FERC AIRs (Vol 13 of Penobscot Mills License Application). |
| | Millinocket Stream Boatability Assessment | 1992 | Information provided in response to FERC's June 8, 1992 AIR #22. | Results provided in Licensee's December 7, 1992 Response to FERC AIRs (Vol 13 of Penobscot Mills License Application). |
| | Recreation Use and Needs Monitoring and Reporting | 2001, 2008, 2014 | Monitoring is performed May thru Sep at Project boat launches and picnic areas. | FERC eLibrary (filed on 10/24/2002, 1/29/2009, 4/28/2015). |
| | Navigation Hazard Study | 2000 | Study to develop a map of navigational hazards at Millinocket Lake Storage and North Twin impoundments. | eLibrary (filed 5/2/2001). |
| **Cultural** | Phase 0 Cultural Resource Assessment | 1988 | | Study report provided in Penobscot Mills License Application, Vol 12 (Non-public information). |
| | Archaeological Phase I Survey and Phase II Testing | 1989, Supplemented 1991 | | Study reports provided in Penobscot Mills License Application, Vol 12 (Non-public information). |
| | Phase III Mitigation Activities | 1998-Current | | FERC eLibrary (Non-public information). |
| **Visual** | Visual Resources Study | 1990 | Study performed by Dewan and Associates that describes and analyzes visual resources and activities within the Penobscot Mills Project study area. | Summary of results provided in Penobscot Mills License Application, Vol 3 with study data provided in Appendix E6-V (Vol 11). |

## Description of 1991 License Application for Penobscot Mills Project

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| | E2-II-2 | 1988 Water Quality Data |
| | E2-II-3 | 1988 Sediment Data |
| | E2-III | Water Quality Study Consultation Correspondence (Vol VI) |
| | E2-IV | Water Quality Study Literature Citations |
| | E2-V-1 | 1987 Study Report for Derivation of 7Q10 Value for West Branch |
| | E2-V-2 | 1990 Study Report for Natural Inflow Study in Penobscot River Basin Upstream of East Millinocket Dam |
| | E2-V-3 | 1988 MDEP West Branch Waste Load Allocation |
| | E2-V-4 | Water Quality Modeling Evaluation of Downstream Impacts Associated with Run-of-River Flow Management |
| | E2-V-5 | Water Use Plan for Ripogenus and Penobscot Mills Projects |
| VIII | Appendix | Report on Fish Resources |
| | | 1990 Report on Study of Aquatic Communities |
| IX | Appendix | Report on Fish Resources |
| | E.3-1-V-1 | 1990 Report on Studies of the Habitat, Fish Populations, and Fisheries of the Penobscot Mills Project |
| X | Appendix | Report on Fish Resources (Study Report Appendices) |
| | E3.1-V-2 | Appendices for 1990 Report on Studies of the Habitat, Fish Populations, and Fisheries of the Penobscot Mills Project |
| | A | Data Tables |
| | B | Bathymetric Maps |
| | C | Study Area Stocking Records |
| | D | 1972-1985 North Twin Impoundment Water Level Data (By Spawning Season) |

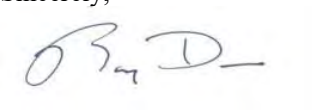
| Volume No. | Content | Description |
|---|---|---|
| | E | 1972-1985 Millinocket Lake Water Level Data (By Spawning Season) |
| | F | 1972-1985 Quakish Lake Water Level Data |
| | G | 1972-1985 Dolby Pond Water Level Data |
| | H | 1972-1985 Daily Flows in the West Branch Below North Twin Development |
| | I | 1972-1985 Daily Flows in Millinocket Stream |
| | J | 1972-1985 Daily Flows Pumped from Millinocket Lake to North Twin Impoundment |
| | K | 1972-1985 Daily Flows in the West Branch Below Millinocket Station Tailrace |
| | L | 1972-1985 Daily Flows in the West Branch at Shad Pond |
| | M | 1972-1985 Daily Flows in the Back Channel |
| | N | 1976-1985 Natural vs. Historic Flow at North Twin |
| | O | 1976-1985 Natural vs. Historic Flow at Stone Dam |
| | P | 1976-1985 Natural vs. Historic Flow at Dolby/East Millinocket Dams |
| | Q | Instream Flow Studies (Millinocket Stream & Back Channel) |
| | Appendix | Report on Botanical Resources |
| | E3.2-II | Botanical Data |
| | E3.2-III | Consultation Correspondence (Vol VI) |
| | Appendix | Report on Wildlife Resources |
| | E3.3-II | Wildlife Data |
| | E3.3-III | Consultation Correspondence (Vol VI) |
| | E3.3-IV | Literature Cited |
| | E3.3-V | Wildlife Management Plan for the Back Channel |
| XI | Appendix | Report on Historical/Archaeological Resources |
| | Appendix | Report on Recreational Resources |
| | E5-I | Resident and Leaseholder Survey |
| | E5-II | Recreation Data Facility Inventory (provides details of facilities including photographs and number of parking spaces) |
| | E5-III | Consultation Correspondence (see Volume VI) |
| | E5-IV | Literature Cited |
| | | Report on Land Management and Aesthetics |
| | E6-II | Land Use Data MLURC Use Standards |
| | E6-III | Consultation Correspondence (see Volume VI) |
| | E6-V | 1990 Report on Visual Resources |
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| | 4 | Average Annual Costs for flows in Upper Gorge, Millinocket Stream, and Back Channel |
| -- | Response to AIRs | Licensee refinement to 11/29/1993 and 2/14/1994 responses |
| -- | Response to Comments on Draft EIS | Licensee response to (2/22/1995) comments on Draft EIS |

If you have any questions regarding this information, please contact me by phone at (207) 775-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman
Licensing Manager, Brookfield Renewable

cc: Distribution List

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

**Federal Agencies**

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637
jeddins@achp.gov

Stephanie Carman
Acting District Manager
Northeastern States
Bureau of Land Management
626 E. Wisconsin Avenue, Suite 200
Milwaukee, WI 53202-4617
scarman@blm.gov

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Kimberly Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006
john.spain@ferc.gov

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930
christopher.boelke@noaa.gov

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473
donald.dow@noaa.gov

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026
jon.hare@noaa.gov

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930
dan.kircheis@noaa.gov

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473
jeff.murphy@noaa.gov

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930
michael.pentony@noaa.gov

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109
kevin_mendik@nps.gov

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330
jay.l.clement@usace.army.mil

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330
jana.l.jacobson@usace.army.mil

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751
richard.c.kristoff@usace.army.mil

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240
darryl.lacounte@bia.gov

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214
harold.peterson@bia.gov

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109
andrew_raddant@ios.doi.gov

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502
DOISOLNE-FERC@sol.doi.gov

Deborah Szaro
New England Region 1
Regional Administrator (Acting)
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912
szaro.deb@epa.gov

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912
timmermann.timothy@epa.gov

Kenneth Hogan
North Atlantic-Appalachian Region Hydropower
Program Coordinator
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03301
kenneth_hogan@fws.gov

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300
julianne_rosset@fws.gov

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587
bryan_sojkowski@fws.gov

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333
nstasuli@usgs.gov

**State Agencies**

Amanda Beal
Commissioner
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
Augusta, ME 04333-0021
dacf@maine.gov

Robert Marvinney
State Geologist
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022
robert.g.marvinney@maine.gov

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333
maine.nap@maine.gov

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022
jim.vogel@maine.gov

Kathy Howatt
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017
kathy.howatt@maine.gov

Melanie Loyzim
Acting Commissioner
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017
melanie.loyzim@maine.gov

Christopher Sferra
Project Manager
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017
christopher.sferra@maine.gov

Judy Camuso
Commissioner
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041
judy.camuso@maine.gov

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493
mark.caron@maine.gov

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493
kevin.dunham@maine.gov

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441
Douglas.Kane@maine.gov

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441
tim.obrey@maine.gov

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041
john.perry@maine.gov

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330
casey.clark@maine.gov

Patrick Keliher
Commissioner
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021
patrick.keliher@maine.gov

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021
sean.m.ledwin@maine.gov

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021
kathleen.leyden@maine.gov

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333
kirk.mohney@maine.gov

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333
megan.m.rideout@maine.gov

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333
arthur.spiess@maine.gov

Maine Public Utilities Commission
101 Second Street
Hallowell, ME 04347

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001
governor@maine.gov

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Sarah Robinson
Executive Director
Piscataquis County
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426
sarah.robinson@piscataquisswcd.org

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Dr. Annette Padilla, PhD
Interim Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462
manager@millinocket.org

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
4 Gabriel Drive, Suite 3
Augusta, ME 04330

Jeffery Gifford
State Representative
346 Frost Street
Lincoln Center, ME 04457
jeffery.gifford@legislature.maine.gov

Peggy Jo Stanley
State Representative
413 Turnpike Road
Medway, ME 04460
peggyjo.stanley@legislature.maine.gov

**Native American Tribes**

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769
epeterpaul@micmac-nsn.gov

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730
csabattis@maliseets.com

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730
istjohn@maliseets.com

Marla Dana
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667
chiefmdana@wabanaki.com

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668
chief.wnicholas@gmail.com

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668
soctomah@gmail.com

John Banks
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468
john.banks@penobscotnation.org

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468
kirk.francis@penobscotnation.org

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468
dan.mccaw@penobscotnation.org

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468
chris.sockalexis@penobscotnation.org

**Additional Parties**

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776
bob@americanwhitewater.org

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802
kevin@americanwhitewater.org

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527
mzakutansky@outdoors.org

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011
jburrows@asfmaine.org

Sarah Sindo
Site Manager
Big Eddy Campground
ssindo@chewonki.org

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401
jeff@bloomerrussell.com

Stephen Perry
Representative
Carpenters Health and Safety Fund
sperry@maine.com

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101
smahoney@clf.org

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401
lumphrey@emdc.org

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401
ahamilton@eatonpeabody.com

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101
brian@myexterus.com

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123
mainequestadventures@gmail.com

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

Thomas White
GNE Holdings, L.L.C.
2275 Half Day Road, Suite 350
Bannockburn, IL 60015

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462
kevin.bernier@brookfieldrenewable.com

Kelly Maloney
Manager
Great Lakes Hydro America LLC
150 Main Street
Lewiston, ME 04240
kelly.maloney@brookfieldrenewable.com

John Dicentes
President
International Association of Machinists
64 Congress Street
Millinocket, ME 04462-1312

Robert Farrington
International Brotherhood of Fireman
HCR 86, Box 195
Medway, ME 04460

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100
abeahm@maineaudubon.org

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Director
Maine Professional River Outfitters
PO Box 669
Millinocket, ME 04462-0669

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096
landis@mainerivers.org

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Bill Houston
Board of Directors
National Wildlife Federation
bhoustonwf@outlook.com

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548
bigeddy@gwi.net

Allison Economy
Representative for Allagash Gateway Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402
aeconomy@rudmanwinchell.com

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101
mstreeter212@gmail.com

Thomas Nannery
Sportsman's Alliance of Maine
RR 1 Box 1174
Augusta, ME 04330-9801

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110
heinz@maine.rr.com

Jeffrey Reardon
Maine Brook Trout Project Director
Trout Unlimited
267 Scribner Hill Road
Manchester, ME 04351
jreardon@tu.org

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Jeff Fayle
jfayle@gmail.com

Peter Forti
granby@cox.net

N. Stuart Harris
nsharris@mgh.harvard.edu

Kathy Houston
khlally14@gmail.com

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105
tjanelle@maine.rr.com

Charles Paone
cpaonejr@gmail.com

Richard Parkes
rparkesbb3@yahoo.com

Ed Spear
307 Mt. Hope Avenue
Bangor, ME 04401
edspear1@yahoo.com

Robert Van Deventer
bobvnert@gmail.com

FEDERAL ENERGY REGULATORY COMMISSION
Washington, DC 20426
September 28, 2021

OFFICE OF ENERGY PROJECTS

Project Nos. 2572-133 & 2458-247 –
Maine
Ripogenus Hydroelectric Project
Penobscot Mills Hydroelectric Project
Great Lakes Hydro America, LLC

**VIA FERC Service**

**Reference: Response to Extension of Time and Additional Public Meeting Requests, and Request for Information for the Ripogenus Project No. 2572-133 and the Penobscot Mills Project No. 2458-247**

To the Parties Addressed:

On August 10, 2021, Commission staff issued Scoping Document 1 for relicensing the Ripogenus Project No. 2572-133 and the Penobscot Mills Project No. 2458-247. Staff conducted two public scoping meetings on September 9, 2021. Following the scoping meetings, several stakeholders filed letters requesting: (1) additional information from Great Lakes Hydro America (GLHA) and Commission staff; (2) an extension of time to file comments on the Preliminary Application Document (PAD) and study requests; and (3) an additional public scoping meeting. These stakeholders included the National Marine Fisheries Service (NMFS; September 13, 2021); the U.S. Fish and Wildlife Service (FWS; September 14, 2021); the Penobscot Indian Nation (PIN) and the Maine Council of Trout Unlimited (Maine Council TU), both on September 16, 2021; and the Maine Department of Marine Resources (Maine DMR) and Maine Department of Inland Fisheries and Wildlife (Maine DIFW), both on September 17, 2021. GLHA responded to the comments and requests on September 17 and September 24, 2021.

Request for Study Reports

NMFS, FWS, the PIN, Maine Council TU,[1] Maine DMR, and Maine DIFW request that GLHA provide copies of the reports from the studies conducted to support

[1] Maine Council TU requests that the 1996 Final Environmental Impact Statement for the projects (FERC, 1996) be provided to all stakeholders. The document is available on the Commission's eLibrary site at https://elibrary.ferc.gov/eLibrary/filedownload?fileid=000B4544-66E2-5005-8110-C31FAFC91712.

the prior relicensing proceedings and other references cited in the PAD.[2] The stakeholders contend that "while broad summaries of the studies performed during the last relicensing were provided in the PAD, a refined synthesis of the data was not provided, nor did GLHA identify data gaps." The June 11, 2021, PAD filed by GLHA meets the Commission's regulatory requirements at section 5.6(d)(3)(i)(B). GLHA made a good faith effort to comply with the regulations in sections 5.2(a) and 5.6(c)(2) by making the documents available at its offices in Lewiston and Millinocket, Maine. However, given advances in technology and the on-going concerns regarding the COVID-19 pandemic, it is reasonable for stakeholders to request on-line access to the studies used to develop the PAD. On September 24, 2021, as directed by the Commission's regulations at section 5.6(c)(2), GLHA filed the study reports requested by the stakeholders for the Ripogenus and Penobscot Mills Projects.

The PIN requests that the Commission provide to the stakeholders any and all information regarding the Commission's response to the *American Rivers* court case where the D.C. Circuit Court (D.C. Circuit) vacated Alabama Power's project license and remanded this matter back to the Commission for further consideration.[3] On June 17, 2021, Commission staff issued a draft supplemental environmental impact statement (EIS) for the Coosa River Hydroelectric Project No. 2146-111 that addresses the issues raised by the D.C. Circuit, which, along with other public documents in the proceeding, is available on eLibrary.[4] However, because this is an on-going proceeding at the Commission, the merits of the case cannot be discussed off the record.[5]

Extension of Time Request

NMFS, FWS, the PIN, Maine Council TU, Maine DMR, and Maine DIFW request that the Commission grant a 90-day extension of time, from when the information described above is received, to file comments on the PAD and study requests for the Ripogenus and Penobscot Mills Projects. The stakeholders state that without the original

[2] The stakeholders also request that GLHA provide 10 years of operations data for each project. This is a request for additional information and not a summary of information used to develop the PAD, and, therefore, is not addressed herein.

[3] *American Rivers v. FERC*, 895 F.3d 32 (D.C. Cir. 2018).

[4] Project No. 2146-111's draft supplemental EIS is available on eLibrary under accession no.: 20210617-3016, available here: https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20210617-3016.

[5] *See* 18 C.F.R. 385.2201 (2020).

study reports, they cannot identify existing data gaps to inform appropriate study requests.

GLHA filed the PAD on June 11, 2021, and there are 120 days for stakeholders to review the PAD and file comments and study requests. There has been ample opportunity for stakeholders' review of the PAD and to request the study reports and other cited references. To delay the process now would push the Commission's Study Plan Determination to July 2022, which would delay the majority of the first year of studies to 2023, and delay any studies needed in the second study season to 2024. The results of any studies conducted in 2024 may not be completed in time to be included in the Preliminary Licensing Proposal (or Draft License Application) or Final License Application. Because the established milestones are designed to prevent undue delay in the relicensing process, and the timing of the field seasons would be negatively affected by a 90-day delay in the process, the stakeholders' request for a 90-day extension of time to file comments on the PAD and study requests is denied.

Request for Additional Public Scoping Meeting

NMFS, the PIN, and Maine DMR request that Commission staff hold an additional public scoping meeting. NMFS, the PIN, and Maine DMR state that the format for the evening public scoping meeting held on September 9, 2021, did not allow meeting participants to hear questions and comments during the meeting, which is contrary to the purposes of the public meeting. The PIN contends that this is a major deviation from the public scoping process and may have discouraged public participation in the meeting.

As was explained in the Commission's August 10, 2021 Public Notice and in Commission staff's SD1, due to on-going concerns with large gatherings related to COVID-19, we did not hold in-person public scoping meetings. Rather, we held virtual public scoping meetings that were recorded by Court Reporters. The transcripts of the meetings will be part of the Commission's record in the proceeding and will be available on eLibrary. Because stakeholders will have an opportunity to review the transcripts and provide comments in response to what was said at the virtual meetings, NMFS's, the PIN's, and Maine DMR's request to hold an additional public scoping meeting is denied.

If you have any questions regarding these matters, please contact Allan Creamer at (202) 502-8365, or allan.creamer@ferc.gov.

James Lepage, Bennington, VT.
I, James Lepage, am a property owner and taxpayer in the state of Maine at two properties. I own land on Caribou Lake, T3 R12, upstream of Ripogenus Dam. I have been at this camp for 41 years. I became aware of the relicensing of the dam, now in progress, and would like to see much more attention given to upstream water levels. Caribou Lake, Chesuncook Lake and the entire watershed upstream of Rip Dam has suffered from low water levels for well over 10 years. Some of this might be attributable to climate change, and therefore future controls on upstream levels will need to be changed for the benefit of wildlife, fish, and landowners. The lake level today is the lowest I have ever seen in 41 years, it is 170’ feet from the highwater mark to the lake at the deepest contour area of the lake system, and in more shallow areas over 500’ of exposed shoreline now take the place of shorefront camps or homes. I would like to see impact studies done on the these water level fluctuations, and the damage done to invertebrates, fish spawning/rearing/growth rates, property values, and wildlife. I hope you will consider my personal concern and requests before relicensing of Rip Dam is finalized. We must see some changes to current practices and aim higher to maintain better quality water levels above and upstream of the dam.
Sincerely,
Jim Lepage
101 Bradley Drive
Bennington, VT 05201

Supplemental comments to public comments on September 9,2021 by Charles Paone in Docket P-2572

I am attaching my original oral comments made on September 9th 2021 (Attachment 1) as no posting has yet been made on the FERC website . Since public comments were made on September 9th, GLHA filed data used to support its filing of 1991 for relicensing of Ripogenous dam. At that time, no additional data was filed to provide support for GLHA's current filing of 2021.

GLHA states that the Ripogenous impoundment is held relatively stable at 941.6 ft during summer months. Over the many years I have been on Caribou lake I have experienced significant fluctuations in lake level during the summer months. Since GLHA continually references overall impacts for the impoundment without specifying specific impacts on the individual basins that make up that impoundment, I am including some pictures to show you what the specific impacts are on Caribou lake.

Attachment 2 shows a picture of Caribou lake in September of this year with 170 ft of lake bed exposed. Although we are currently in a drought I have additional pictures which will show the fluctuation of the water levels in the summertime when GLHA claims the elevation remains relatively close to normal. I have additional pictures which will show the water lapping at the shoreline on July, 2017 while each of the previous two years the water during the same month of July is substantially away from the shoreline. The water levels in 2020 were similar to those experienced in 2021. I do not know what the elevation of the lake was during these years as GLHA has not provided that data but I can only assume it was well below the 941.6 ft.

The Ripogenous impoundment consists of six basins each with their own characteristics. No data has been provided to show the impacts of GLHA's water management on Caribou lake regarding drawdown effects on lake bed exposure, navigation and, recreational use other than the public statement by GLHA on September 9th admitting problems with access to the boat ramp on Caribou lake due to water levels.

The greatest concern is GLHA provides no commitment to monitor and collect annual data to evaluate the validity of the critical assumptions used to develop their water management plan. For example, one critical assumption is the spring inflows from the spring runoff. Without sufficient runoff we will see the lake conditions I have shown on attachment 2. Climate change makes this critical assumption and unknown going forward. Without sufficient inflow to the impoundment all the parties will be negatively impacted and may require periodic adjustments to the water Management plan **during** the next license period.

I respectfully asked the commission to require GLHA to conduct annual measurements to include impoundment elevations at late spring, late summer and, late winter. Also to consider the impacts on Caribou lake in its water management plan.

Clearly these are challenging times regarding the changing climate conditions. It would be reckless to develop a water management plan that does not provide for the collection of data on an annual going forward basis to both assess the validity of GLHA's assumptions and to provide the basis to make more accurate assumptions and to adjust the water Management plan as required to best meet the needs of all the parties.

Attachment 1

Comments on Docket P-2572 by Charles Paone (cpaonejr@gmail.com)

A review of this filing raises concerns regarding the impact the annual drawdown of the Ripogenus impoundment has on the water levels of Caribou lake. By early to mid summer Caribou lake often experiences a significant reduction in water level, even beyond the last two drought years. This reduction in the water levels and exposure of the lakebed makes it very difficult for access to the lake from the many houses located on it. Further with such low levels of water, navigation has become very hazardous and access to Chesuncook & Ripogenous lakes from Caribou lake is almost impossible and likely to be impossible by September. The Caribou boat launch is frequently made useless due to the low water levels in the summer.

The Pre-Application Document (PAD) states that the full pond elevation during normal times is 941.6 ft. It further states, "During normal operation and normal inflow years, the Ripogenous impoundment elevation is held relatively stable at 941.6 feet during summer months and is gradually drawn down starting in the fall, with a target low elevation of 913.6 feet by late winter, in anticipation of spring thaw and high flows." I have been on Caribou lake since 1968 and have frequently seen significant reductions of water and increases in lakebed exposure during summer months often in excess of 50 to 60 feet.

In paragraph 3.1.4 Proposed Environmental Measures, Great Lakes Hydro America (GLHA) proposes to continue to operate and maintain certain environmental measures. These measures include certain recreational resources such as, white water boating flows, operate and maintain 11 recreational sites and, a commitment to continue to collect recreation use information every 6 years. However, none of these measures addresses adequate water levels at Caribou lake and the impact it has on the recreational use of the landowners and homeowners on Caribou lake all of whom have made a significant financial commitment to the area.

Since this license would establish the criteria for operation for the next 50 years and given the obvious rapidly changing climate conditions that have been documented and well-established by many governmental agencies including NOAA, there needs to be a periodic review process to ensure that the critical assumptions used in developing the water usage criteria reflect todays environment and are adjusted in the future as necessary to reflect changing environmental conditions. Assumptions such as normal water elevation in the impoundment and normal inflows need to be continually monitored in order to determine what the appropriate outflow requirements should be. Certainly, it is unrealistic to assume the water level requirements that were established some time ago will continue to be appropriate in the next 50 years given the serious climate changes we are all experiencing.

It would be helpful to better understand these issues if the following information could be provided.

1. In what year was the normal full pond elevation of Ripogenous impoundment of 941.6 ft established?

2. In paragraph 3.1.3 it is stated that the Ripogenous impoundment elevation is held relatively stable at 941.6 feet during the summer months and is gradually drawn down starting in the fall.

A review of any studies or data for the last 10 years for the Ripogenous impoundment showing:

- the **actual** normal elevation at the start of summer per year

- the **actual** elevation starting at the beginning of fall per year.

- the actual maximum drawdown per year.

- the actual low elevation by late winter per year

3. Is there any data regarding water levels, recreational impacts, or navigation issues for Caribou lake?

Attachment 2



Brookfield
Renewable

September 30, 2021

***Via Electronic Filing***

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Supplemental Information – Virtual Site Review Information and Responses to Stakeholder Questions**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), a subsidiary of Brookfield Renewable and Licensee of the Ripogenus Hydroelectric Project and Penobscot Mills Hydroelectric Project (collectively referred to as the "Projects"), herein files supplemental information consisting of a copy of the PowerPoint slides presented by GLHA during the site review meeting as well as information in response to stakeholder questions and comments during the September 9, 2021 scoping and site review meetings.

On June 11, 2021, GLHA filed the Notices of Intent and Pre-Application Document (PAD), which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through the Federal Energy Regulatory Commission's ("FERC" or "Commission") Integrated Licensing Process (ILP). Based on the ILP regulations and the Process Plan and Schedule provided in the PAD, FERC issued Scoping Document 1 on August 10, 2021, and subsequently conducted daytime and evening virtual scoping meetings on September 9, 2021. Additionally, during the afternoon of September 9, 2021, GLHA hosted a virtual environmental site review, which provided stakeholders with a comprehensive overview of the Projects utilizing drone video, photographs, and PowerPoint slides. Open question-and-answer sessions were held during FERC's daytime scoping meeting, as well as following the Project presentation during the virtual site review. GLHA notes that during the two question-and-answer sessions, all participants were encouraged to provide comments and to ask any questions regarding the Projects, and neither session was concluded until meeting participants had no further comments or questions.

## Virtual Site Review Information

As noted above, during the September 9, 2021 virtual site review meeting, GLHA provided a Project overview, including a PowerPoint presentation related to the Projects' previous relicensing, the current license requirements, water management, and environmental resource areas such as recreation, water quality, fisheries, wetlands and wildlife. Based on stakeholder requests during the virtual site review meeting, GLHA is filing a copy of the PowerPoint slides presented on September 9.

## Information Requests

During the two open question-and-answer sessions, GLHA addressed stakeholders' questions and comments. However, there were a few questions or requests that could not be addressed during the September 9, 2021 meetings. Therefore, GLHA is herein providing information that is readily available to try to address the stakeholder questions and comments noted during the meetings.

### Site Review Images

*Stakeholder Comment:* During the virtual site review meeting, stakeholders asked GLHA to indicate the dates on which the drone video and photographs presented during the Project overview were taken.

*GLHA Response:* GLHA collected drone footage on May 18-20, 2021, as further described below. Additionally, photographs of Project features were obtained on April 27-28 and May 18-20, 2021. The exceptions were the photographs included of Umbazooksus Stream East Campsite (the date of which is unknown) and Caribou Lake Boat Launch taken on September 27, 2018 (at an impoundment elevation of 925.6 feet).

| Drone Data Collection Date | Development | Location | Operating Conditions |
|---|---|---|---|
| May 18 | Ripogenus | Dam to McKay Station | Leakage flow from dam |
| May 18 | Ripogenus | McKay Station | Total flow of ~2,200 cfs |
| May 18 | Ripogenus | Holbrook Side Channel | Flow through both pipes into the channel |
| May 18 | Millinocket Lake | Pumping Station | No pumping (both pumps offline) |
| May 19 | Millinocket | Stone Dam | Leakage flow from dam |
| May 19 | Millinocket | Hydro Station | Total flow of ~2,050 cfs |
| May 19 | North Twin | Dam and Downstream | Total flow of ~2,100 cfs |
| May 19 | East Millinocket | Dam/Powerhouse | Total flow of ~2,200 cfs |
| May 19 | Dolby | Dam/Powerhouse | Total flow of ~2,200 cfs |
| May 19 | Millinocket Lake | Dam | ~75 cfs from dam into Millinocket Stream |
| May 20 | Millinocket | Back Channel | Leakage flow from Stone Dam |

### Holbrook Side Channel

*Stakeholder Comment:* During the evening scoping meeting, a stakeholder asked about the amount of flow entering the Holbrook Side Channel under minimum flow conditions in the West Branch.

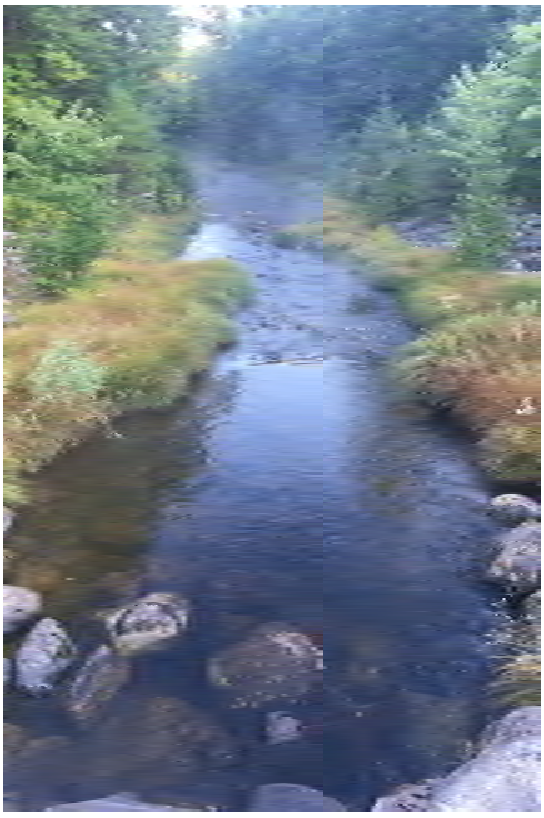
*GLHA Response:* As indicated in the PAD, the Holbrook Side Channel is a 1,400-foot-long channel located approximately 1.7 river miles downstream from the Ripogenus Dam in which flow is diverted from the West Branch for landlocked salmon spawning and rearing. Flow from the channel re-enters the West Branch approximately 1,000 feet downstream. Flows into the channel are controlled through two pipes, one of which is equipped with a valve that can be opened or closed to increase or reduce flow from the West Branch into the channel. Flows into the channel are designed to range between approximately 35 and 65 cfs during normal operating conditions, depending on the amount of flow in the West Branch.

Pursuant to license requirements, around June 1 each year GLHA closes the valve to reduce flow into the channel (for landlocked salmon fry emergence and production). Around October 15, GLHA opens the valve to increase flow into the channel (for landlocked salmon spawning).

GLHA periodically inspects the Holbrook Side Channel in support of annual maintenance; based on these inspections and the biannual valve adjustments, GLHA is not aware of the Holbrook Side Channel becoming dewatered. At times, debris may accumulate at the inlets to the discharge pipes resulting in a reduction of flow entering the channel; however, GLHA performs maintenance to clear the debris when observed.

Following the scoping meetings, on September 14, 2021 at 7:00 AM, GLHA staff obtained photographs (provided below) of the upstream portion of the Holbrook Side Channel where flow enters the side channel. The photographs were taken during the fry emergence and production period (i.e., low flow into the channel) when flows in the West Branch were approximately 1,000 cfs.



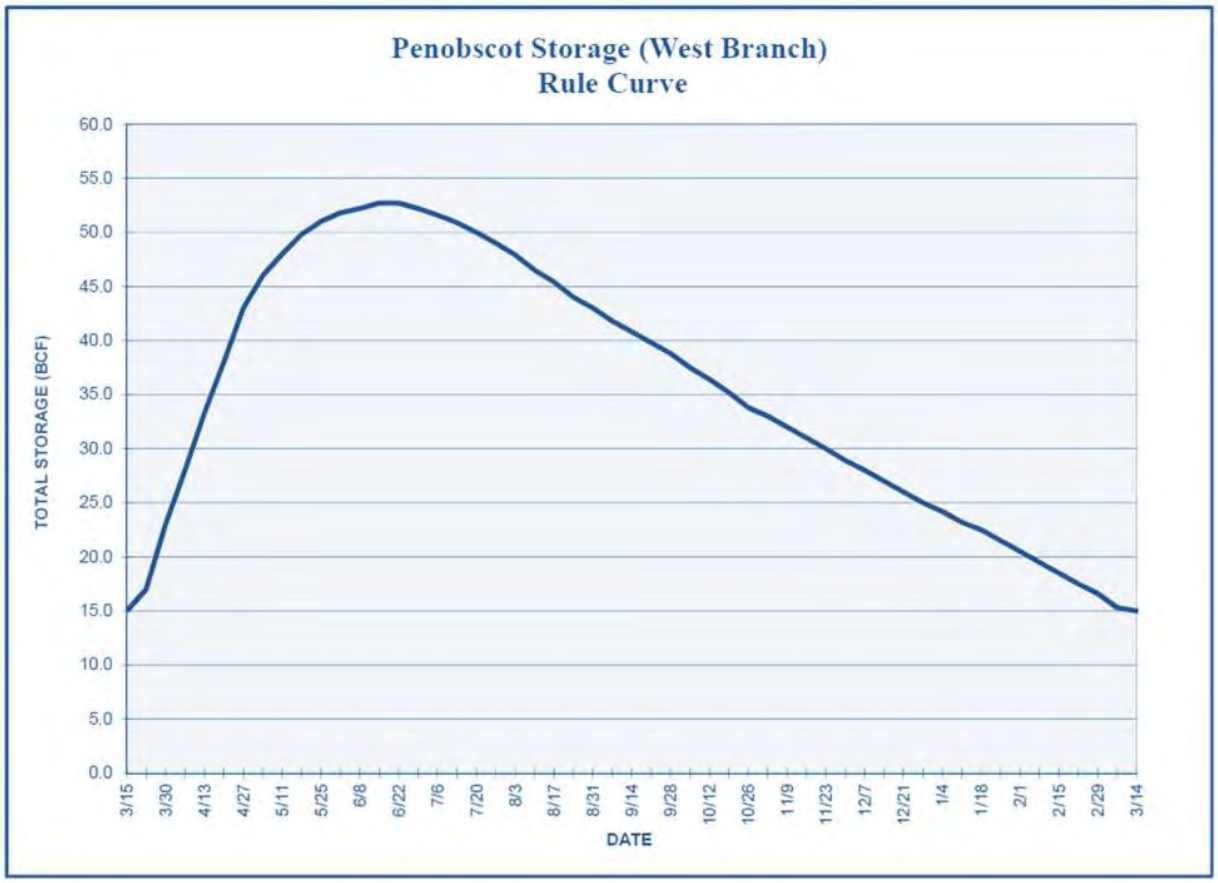


**Impoundment Rule Curve**

*Stakeholder Request:* During the virtual site review meeting, a stakeholder asked if GLHA could provide the rule curves used to operate the store-and-release impoundments associated with the Projects.

*GLHA Response:* As indicated during the virtual site review meeting, GLHA does not operate the Projects

using impoundment-specific rule curves, as the Projects are operated in conjunction with the upstream Storage Project (FERC No. 2634) as a storage system to meet overall system needs, including the flow and impoundment elevations required by the current licenses. Instead, GLHA uses a total storage-system guide curve indicating the available storage in the system in billion cubic feet (as provided below).




**Ripogenus Impoundment Elevations**

*Stakeholder Comment:* During the daytime scoping meeting, stakeholders asked if GLHA could provide photographs of the Ripogenus impoundment during lower impoundment elevations.

*GLHA Response:* As indicated in the PAD, the normal full pond elevation of the Ripogenus impoundment is 941.6 feet with a maximum drawdown of 44 feet (based on operational limitations of the Project). During normal operations and inflows, the Ripogenus impoundment is operated such that the impoundment is refilled following seasonal inflow after snow/ice-melt and is gradually drawn down throughout the year to meet overall system needs until a low elevation is reached in late winter to allow for the spring run-off and precipitation to refill the impoundment again. Below are photographs of Ripogenus impoundment taken in November 2001 when the impoundment elevation was approximately 919 feet (23 feet below full pond elevation). The year 2001 was the driest year out of the last 20 years.

**Photograph of Ripogenus dam from the Ripogenus impoundment when the impoundment elevation was approximately 919 feet (taken November 19, 2001).**



**Photograph of Ripogenus impoundment at the old Chesuncook Dam near the Chesuncook Dam Point Boat Launch when the impoundment elevation was approximately 919 feet (taken November 19, 2001)**.



**Effects on Impoundment Elevation during Millinocket Lake Pumping Station Operation**

*Stakeholder Comment:* During the virtual site review meeting, a stakeholder asked how impoundment elevations at North Twin and Millinocket Lake Storage Impoundments are affected during pumping operations.

*GLHA Response:* As indicated in the PAD, a pumping station is located on the west side of Millinocket Lake, approximately 6.2 miles from the dam, and it is used to pump water from Millinocket Lake into Ambajejus Lake within the North Twin impoundment. The pumping station consists of a concrete substructure and a brick superstructure with an adjoining intake section equipped with trashracks consisting of 3/16-inch bar steel with a clear spacing of 1 inch. Two vertical wet pit pumps each with a capacity of 250 Hp and 122 cfs (total capacity of 244 cfs), pump water to Ambajejus Lake via two underground, 4.5-foot-diameter pipes extending approximately 544 feet from the pumping station to the outlet structure. The outlet structure at Ambajejus Lake consists of a concrete substructure and concrete wingwalls. Two steel gates at the outlet structure can be used to prevent backflow from Ambajejus Lake when the pumps are not operating.

Assuming no other inflow, one pump, running for 24 hours, will result in a reduction of the Millinocket Lake Storage impoundment elevation of approximately 0.5 inch and an increase in the North Twin impoundment elevation of less than 0.25 inch. However, the actual effect to impoundment elevations is usually much less than described above, as there is typically tributary inflow into the Millinocket Lake Storage impoundment and tributary and controlled inflows (from the Ripogenus Project) into the North Twin impoundment.

GLHA primarily uses the pumps during periods of increased inflows to the Millinocket Lake Storage impoundment to: (1) stabilize the impoundment water level, and (2) attenuate high flow releases from Millinocket Lake Storage dam, which can otherwise contribute to flooding in the Town of Millinocket along Millinocket Stream. Any water pumped into the North Twin impoundment also benefits maintenance of the North Twin impoundment elevation and supplements hydroelectric generation at the North Twin and Millinocket powerhouses. GLHA avoids operating the pumps during the winter season to avoid thin ice conditions in the vicinity of the outlet at Ambajejus Lake, which can be a public safety hazard for snowmobilers.

**Shoreline Conditions at Low Impoundment Elevations**

*Stakeholder Comment:* During the virtual site review meeting, a stakeholder asked about the amount of habitat that was dewatered when the impoundments were at their lower elevations.

*GLHA Response:* During the previous relicensing of the Projects, the effect of the seasonal drawdown cycles of the Ripogenus, Millinocket Lake Storage, and North Twin impoundments on aquatic habitat was thoroughly examined. The other Penobscot Mills Project impoundments were not evaluated as they are operated in a run-of-river mode and experience only minimal impoundment fluctuations.

In north temperate lakes the maximum primary productivity, aquatic community growth and

development, occurs predominantly during the ice-free "growing season." Therefore, impoundment drawdowns typical (median) of the growing season (May 1 through October 31) were examined and the amount of aquatic habitat dewatered during this period was estimated. At the Ripogenus impoundment, it was estimated that 2,064 acres of littoral habitat were dewatered between full pond elevation (941.59 feet) and the median growing season drawdown elevation of 936.92 feet. At the Millinocket Lake Storage impoundment, it was estimated that 493 acres of littoral habitat were dewatered between full pond elevation (480.0 feet) and the median growing season drawdown elevation of 478.82 feet. At the North Twin impoundment, it was estimated that 1,445 acres of littoral habitat were dewatered between full pond elevation (491.92 feet) and the median growing season drawdown elevation of 489.09 feet.

These results are described fully in Volume VIII of the License Applications filed in December 1991 for the Ripogenus and Penobscot Mills Projects, respectively.

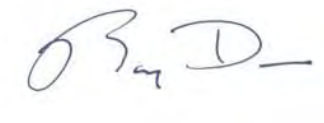
**Recreation Facility Parking Spaces**

*Stakeholder Comment*: During the virtual site review meeting, a stakeholder asked how many parking spaces were available at each Project recreation facility.

*GLHA Response*: As indicated in the PAD, GLHA proposes to perform a Recreation Facility Inventory and Condition Assessment for each Project in support of obtaining new licenses for the Projects. As part of this assessment, GLHA will document the current number of parking spaces available at the Projects' recreation facilities with results provided in the Initial Study Report, which is anticipated to be filed with FERC during the second quarter of 2023.

If you have any questions regarding this information, please contact the undersigned at (207) 775-5605 or randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman
Licensing Manager, Brookfield Renewable

Attachment: PowerPoint Slides Presented by GLHA during the September 9, 2021 Virtual Site Review

cc: Distribution List

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

**Federal Agencies**

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637
jeddins@achp.gov

Stephanie Carman
Acting District Manager
Northeastern States
Bureau of Land Management
626 E. Wisconsin Avenue, Suite 200
Milwaukee, WI 53202-4617
scarman@blm.gov

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Kimberly Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006
john.spain@ferc.gov

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930
christopher.boelke@noaa.gov

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473
donald.dow@noaa.gov

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026
jon.hare@noaa.gov

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930
dan.kircheis@noaa.gov

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473
jeff.murphy@noaa.gov

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930
michael.pentony@noaa.gov

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109
kevin_mendik@nps.gov

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330
jay.l.clement@usace.army.mil

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330
jana.l.jacobson@usace.army.mil

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751
richard.c.kristoff@usace.army.mil

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240
darryl.lacounte@bia.gov

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214
harold.peterson@bia.gov

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109
andrew_raddant@ios.doi.gov

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502
DOISOLNE-FERC@sol.doi.gov

Deborah Szaro
New England Region 1
Regional Administrator (Acting)
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912
szaro.deb@epa.gov

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912
timmermann.timothy@epa.gov

Kenneth Hogan
North Atlantic-Appalachian Region Hydropower
Program Coordinator
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03301
kenneth_hogan@fws.gov

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300
julianne_rosset@fws.gov

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587
bryan_sojkowski@fws.gov

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333
nstasuli@usgs.gov

**State Agencies**

Amanda Beal
Commissioner
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022
dacf@maine.gov

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022
stephen.m.dickson@maine.gov

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333
maine.nap@maine.gov

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022
jim.vogel@maine.gov

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Kathy Howatt
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017
kathy.howatt@maine.gov

Melanie Loyzim
Acting Commissioner
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017
melanie.loyzim@maine.gov

Christopher Sferra
Project Manager
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017
christopher.sferra@maine.gov

Judy Camuso
Commissioner
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041
judy.camuso@maine.gov

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493
mark.caron@maine.gov

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493
kevin.dunham@maine.gov

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441
Douglas.Kane@maine.gov

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441
tim.obrey@maine.gov

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041
john.perry@maine.gov

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330
casey.clark@maine.gov

Patrick Keliher
Commissioner
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021
patrick.keliher@maine.gov

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021
sean.m.ledwin@maine.gov

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021
kathleen.leyden@maine.gov

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333
kirk.mohney@maine.gov

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333
megan.m.rideout@maine.gov

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333
arthur.spiess@maine.gov

Maine Public Utilities Commission
101 Second Street
Hallowell, ME 04347

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001
governor@maine.gov

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426
sarah.robinson@piscataquisswcd.org

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Dr. Annette Padilla, PhD
Interim Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462
manager@millinocket.org

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
4 Gabriel Drive, Suite 3
Augusta, ME 04330

Jeffery Gifford
State Representative
346 Frost Street
Lincoln Center, ME 04457
jeffery.gifford@legislature.maine.gov

Peggy Jo Stanley
State Representative
413 Turnpike Road
Medway, ME 04460
peggyjo.stanley@legislature.maine.gov

**Native American Tribes**

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769
epeterpaul@micmac-nsn.gov

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730
csabattis@maliseets.com

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730
istjohn@maliseets.com

Marla Dana
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667
chiefmdana@wabanaki.com

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668
chief.wnicholas@gmail.com

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668
soctomah@gmail.com

John Banks
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468
john.banks@penobscotnation.org

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468
kirk.francis@penobscotnation.org

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468
dan.mccaw@penobscotnation.org

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468
chris.sockalexis@penobscotnation.org

**Additional Parties**

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776
bob@americanwhitewater.org

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802
kevin@americanwhitewater.org

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527
mzakutansky@outdoors.org

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011
jburrows@asfmaine.org

Sarah Sindo
Site Manager
Big Eddy Campground
ssindo@chewonki.org

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401
jeff@bloomerrussell.com

Stephen Perry
Representative
Carpenters Health and Safety Fund
sperry@maine.com

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101
smahoney@clf.org

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401
lumphrey@emdc.org

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401
ahamilton@eatonpeabody.com

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101
brian@myexterus.com

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123
mainequestadventures@gmail.com

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

Thomas White
GNE Holdings, L.L.C.
2275 Half Day Road, Suite 350
Bannockburn, IL 60015

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462
kevin.bernier@brookfieldrenewable.com

Kelly Maloney
Manager
Great Lakes Hydro America LLC
150 Main Street
Lewiston, ME 04240
kelly.maloney@brookfieldrenewable.com

John Dicentes
President
International Association of Machinists
64 Congress Street
Millinocket, ME 04462-1312

Robert Farrington
International Brotherhood of Fireman
HCR 86, Box 195
Medway, ME 04460

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100
abeahm@maineaudubon.org

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Director
Maine Professional River Outfitters
PO Box 669
Millinocket, ME 04462-0669

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096
landis@mainerivers.org

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Bill Houston
Board of Directors
National Wildlife Federation
bhoustonnwf@outlook.com

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548
bigeddy@gwi.net

Allison Economy
Representative for Allagash Gateway Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402
aeconomy@rudmanwinchell.com

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101
mstreeter212@gmail.com

Thomas Nannery
Sportsman's Alliance of Maine
RR 1 Box 1174
Augusta, ME 04330-9801

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110
heinz@maine.rr.com

Jeffrey Reardon
Maine Brook Trout Project Director
Trout Unlimited
267 Scribner Hill Road
Manchester, ME 04351
jreardon@tu.org

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Jeff Fayle
jfayle@gmail.com

Peter Forti
granby@cox.net

N. Stuart Harris
nsharris@mgh.harvard.edu

Kathy Houston
khlally14@gmail.com

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105
tjanelle@maine.rr.com

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Charles Paone
cpaonejr@gmail.com

Richard Parkes
Rparkesbb3@yahoo.com

Ed Spear
307 Mt. Hope Avenue
Bangor, ME 04401
edspear1@yahoo.com

Robert Van Deventer
bobvnert@gmail.com

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E. Room 1A
Washington, DC 20426

September 30, 2021

Filed Electronically

Comments on the PAD and Commission staff's Scoping Document 1, Ripogenus Project (2572 – 133) and Penobscot Mills Project (2458-247)

My name is Edward Spear. Beginning in 1977 and continuing into the early 2000s I worked for (then) Great Northern Paper (GNP) as a fisheries biologist with my primary responsibility being the West Branch of the Penobscot River (WB) drainage (from the Quebec boundary to the Medway Dam). During this period, I collected and analyzed data and co-authored FERC applications for Big A, Ripogenus, Penobscot Mills, and the Storage Projects. During that time, I participated in numerous agencies, stakeholder, and Non Government Organizations workshops and meetings as well as overseeing mitigation and enhancement measures. I believe I qualify as an expert of the West Branch of the Penobscot River drainage. The following comments are a continuation of verbal testimony made on the evening of September 9, 2021 and should be regarded as expert testimony.

This winter Great lakes Hydro America GLHA a subsidiary of Brookfield Renewable (Collectively the Licensee) filed a Notice of Intent (NOI) and a Pre-Application Document (PAD) for the now combined Ripogenus and Penobscot Mills Projects. Flash forward 25 years. There are no longer paper mills connected to the hydro system and the interconnection to the grid has been upgraded. Economic signals from the market place put more value on peak power than base-load power. The Licensee has responded to those incentives by using the West Branch system as a massive spinning reserve power source to enrich its coffers at the expense of the balance heretofore beneficial to the fisheries of the system. It is my contention that this operation was not allowed under the existing operating licenses, and should be specifically prohibited going forward. While (hourly) archival flow data are not available, peaking flows appear to extend downriver to West Enfield (USGS flow records for West Enfield) on the mainstem Penobscot. For all facilities, the Licensee needs to make (1997- current) hourly river flow, power generation and impoundment elevation records available to the public.

To summarize, the PAD stated that nothing had changed “the licensee maintains that nothing has significantly changed” and fisheries and aquatic communities are healthy. They say this without any studies or presence on the WB in nearly 20 years! Section 1-11 of the notice states “the licensee maintains that a full suite of new studies is not needed, that the vast body of information on which today’s certifications and licenses are soundly based and should be relied upon for these relicensings”. Brookfield has sponsored a number of studies in the Magpie and Batchawana Rivers

(Marty et al, 2009, Smokorowski et al, 2010) and is well aware that for the Ripogenus and Penobscot Mills projects and the change to peaking operations, nothing could be further from the truth. Fish and macroinvertebrates are well below the 1980s levels used in the 1992 license application and the (final) Environmental Impact Statement (EIS) and 1996 license. Below North Twin Dam and Mill One Station salmon populations have also declined and with these declines, so has salmon angling activity and success.

Landlocked salmon (Salmo salar) are the primary sport fisheries inhabiting the West Branch drainage. The Maine Department of Inland Fisheries and Wildlife (MeDIFW) manages these river segments and impoundments of the West Branch for this species. The segment of the WB below Ripogenus Dam downstream to Debsconeag Falls supports a unique Landlocked salmon (salmon) fishery. All life cycles, spawning, nursey, summer, and overwintering habitat occur in the water below McKay Station. Salmon spent their entire life in the West Branch, rarely moving downstream. The EIS states "(West Branch, downstream of McKay Station) fishing quality is high at 0.41 fish per day. The average size is 18.2" and 2.2 pounds" (EIS 3-37). The existing fishery is now limited to the 1.25 miles below McKay Station (communications with WB anglers). An eighteen inch salmon is now a trophy (personal communications and observation) rather than the historic norm. The EIS states the West Branch below McKay Station is a unique fishery. The current fisheries (and aquatic communities) need to be returned to 1980's and 1990's levels and deserve full protection.

Flows below McKay are no longer "relatively stable" and salmon abundance and growth has suffered. Studies have shown that juvenile salmon are forced to relocate (Scruton et al., 2011) during peaking events resulting in loss of feeding time, energy expenditure and subject to predation. Studies of adult salmon whose life-history is totally contained in a riverine environment is limited to the West Branch below McKay Station and possibly Indian Pond/Harris Station (where successful riverine reproduction has NOT been identified). Thus, only the Indian Pond study on salmon and peaking is available. The Indian Pond Project (FERC 2142) studied movement of salmonid fish below Harris Dam. While downstream movement was generally absent, salmon moved laterally to avoid higher velocities during peaking events (EPRO 1999). Thus, most impacts of peaking operations are found in studies of other closely related salmonid species. Quinn and Kwak (2011) found brown trout (Salmon trutta) and rainbow trout (Orcorhychus mykiss) were found in velocity refugia near an Ozark river's margin during high flow. Ayllon et al (2008) found that age I+ and older brown moved in response the flow and velocity changes. Lagarrigue et al (2002) found reduced brown trout abundance below a hydro system when compared to a "control site" in in the French Pyrénées. While numerous studies suggest that peaking operations have little effect on up or downstream movement, lateral movement and habitat selection in response to flow alterations may seriously reduce salmon feeding activity and growth

Fisheries concerns of the 1996 license focused on maintaining the existing 1980s fisheries (virtually all WB data are from studies conducted in the 1980s) and increasing production of salmon parr (identified as the factor that limited the WB salmon population). A dewatered side channel below Holbrook Pool provided an opportunity to create habitat for the limiting salmon life stage(s), age 0+

and 1+ salmon (parr). Article 406 required providing flow to this previously dewater river section. This was provided by excavation and by placing two gated operated culverts that extended out into Holbrook Pool. Depending on season (spawning or "growing") flows of between 35 and 65 cfs would be passed though the gated system. Studies prove the plan a success. Changes in project operation from the traditional "mill operations" to peaking changed age 0+ and parr production. Juvenile salmon are vulnerable to peaking flows **(Scruton et al, 2011).** At flows of 1800 cfs flow into Holbrook are serious reduced and flows of 1000-1100 cfs dewater the side channel eliminating Article 406 goals and seriously jeopardize parr production in mainstem reaches. Low (1100 cfs) flow occurred during a weekend in late July and have routinely continued during early September. Any enhancement visualized by Article 406 was lost.

The West Branch downstream of McKay Station was once famous for mayfly (ephemeral) and caddis (Trichoptera) hatches, notable Hydrophycid that favor high velocity areas. Trotsky and Gerogory 1974, found peaking flows below Wyman Dam reduced aquatic insect abundance. Cushman (1985) in what is best described as literature review, compiled an excellent study of the alterations to fish and macroinvertebrates caused by peaking operations. Mayfly hatches that once clouded the sky in late May have declined to a point where few anglers fish the runs/pools immediately above Neswodnehunk Deadwater. Caddis hatches have declined to the point where they no longer fill outdoor lanterns after sunset. Lesser species such as morning and evening duns (baitids) are no longer common. All these species are critical food items for juvenile and (during the summer "maintenance period") adult salmon in their larval (naiad) and adult stages (sub imago, imago) or in the case of caddis, pupae and moths. In 1981, Normandeau Associates surveyed multiple locations of the WB below McKay Station. The results are shown in the Big A application and should be easy to duplicate.

Smelt (Osmerus mordax) are the critical element of growth and survival of adult salmon. West Branch salmon in the reaches below McKay Station as well as salmon below North Twin and Mill One tailwaters depend on smelt spawned in streams (and the upper West Branch) that empty into the many Ripogenus and North Twin impoundment shallow embayments. Larval smelt spawned during the end of April, drift into these embayments before moving into deeper water areas where they feed on zoo plankton in or just above the thermocline. This life stage strategy segregates the young-of-the year (YOY) from adult smelt (that are cannibalistic) that inhabit areas in or below the thermocline. As the YOY smelt move is search of food and space they wander into the McKay, North Twin and Mill One station intakes and provide the critical downstream food source for sub adult and adult salmon. These phenomena occur in most months, with mid to late April, as the impoundments fill, being the period of least drift. During the 1980's West Branch smelts catch was in the range of 25,000 pounds annually (SEE Big A application) and smelt could be seen washed up along the Big Eddy shore. Similar smelt catches were recorded below downstream facilities. Smelt are no longer seen in the lower stretch of the river and only once reported washed up at the Big Eddy in the last five years. Salmon growth and abundance has suffered. The lost/shifting of

Ripogenus impoundment littoral areas caused by draining the impoundment for peaking power is a likely reason for the reduced smelt production.

Lake white fish (LWF) that were once common in the Ripogenus impoundment declined in the 70's and numbers observed during the 1996 relicensing studies revealed only a small population near Umbazookas Stream. Laval LWF are extremely vulnerable to predation by smelt (Gorsky and Zydlewski 2013, Loftus and Hulsman, 1986). What was presumed to be a relic LWF population observed at the confluence of Umbazookas Stream, was assumed to be a pre-spawning concentration. LWF spawn in mid-November and fry drift into embayments after ice out. The timing of fry outmigration and post spawning activity is identical to smelt. Adult smelt are very predaceous and the timing of (post spawning) smelt-whitefish fry behavior has been the given for the reason of declining LWF stocks in the Great Lakes (D. H. Loftus and P. F. Hulsman, 1986), given the decline in the Ripogenus smelt population, a full pond operation from May 1st though July 15 would provide addition shallow littoral areas such as Umbazookus Bay for juvenile LWF escapement from (adult) smelt.

Water Use Plan: Until recently (circa 2005), West Branch flows were used to generate power for paper production and impoundment(s) storage was closely monitored to ensure that storage would not be depleted. Weekly flow and generation followed what was called a "rule curve". The Water Use Plan (WUP) was developed from and followed what was then "called rule curve operations". While the need for storage for paper making is gone, the need to provide (biological) flow in the months before spring runoff remains. The present license(s) require flows during the (salmon) spawning and incubation period except in "events beyond the applicant's control". There is no prohibition on running out of storage thus there is no guarantee that the West Branch below McKay Station won't revert to the pre-McKay era of winter flows in the 200 cfs range. Flows below North Twin dam are governed by state charter that requires 2000 cfs "by Millinocket". The WUP needs to be revisited to ensure Ripogenus impoundment storage is available to meet biological flow needs e.g., 1450 cfs, during winter and spring.

Upper Gorge flow; Article 401 of the Ripogenus License requires, in order to produce fishing opportunity, an Upper Gorge (UG) flow of 100 cfs beginning on July 1st. Historical flow into the UG was though a "deep gate" and provided a flow cooler than the surface discharge of the McKay Turbines. Presently, UG flow is through a small sluice gate (historically used for logging) and provides (warmer) surface water. In effect, this flow regime acts more as a fish repellent than attraction. This was not what was intended by the authors (namely MeDIFW) in the licensing proposal. The EIS took a simplistic view of the UG plan. While increased fishing opportunity was the primary goal, the (hoped for) cooler UG flows would provide a thermal refuge and "spread out" the salmon population during the warmer summer months thus reducing stress and predation.

Salmon fishing has declined at North Twin (Dam) and Mill One (formerly the Grinder Room) tailraces. These fisheries can easily supplement by providing flow into the backchannel (the historic West Branch channel). The EIS traded 200 backchannel (legal sized) salmon for 243 Mill jobs.

Neither the GNP Mills nor jobs exist today and the opportunity to replace lost fishing opportunity should be investigated. In the event that downstream escapement form the North Twin Impoundment proves inadequate, salmon could be easily stocked. Somewhat overlooked in the EIS is the fact that Shad Pond would provide excellent (salmon) over-wintering habitat.

For the reasons outlined above, FERC should require extensive studies that will provide information needed to restore the WB drainage to 1980s fish and aquatic community levels discussed in the 1996 EIS. The licensee's PAD filing suggests a total lack of knowledge of present WB drainage wide fisheries and aquatic conditions. FERC has a duty to mandate the necessary studies. All fisheries related studies should be supervised by MeDIFW as it is the (state) agency that has (fisheries) responsibility.

Thank you for the opportunity to respond

Contact info;

Ed Spear

307 Mt Hope Ave

Bangor, Me 04401

Phone: 207-217-4288

Email: edspear1@yahoo.com

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Jeffrey Scott Murphy, Orono, ME.
Email from Jeff Murphy (NMFS) to Randy Dorman (GLHA) and Jim Gibson (HDR) dated October 1, 2021

Hello Jim and Randy - Thank you for providing estimates of the amount of riparian habitat exposed in the Ripogenus, Millinocket Lake, and North Twin impoundments in your September 30, 2021 letter to FERC. However, I believe the question raised during the Sept. 9, 2021 virtual scoping meeting was related the the amount of littoral habitat that is exposed in the project impoundments during their lowest licensed elevations rather than during the "growing season". Based upon data presented in the June 2021 PAD, I understand that:

1)The current license for the Ripogenus Project allows for a drawdown up to 44' feet ( El. 897.59'); your September 30, 2021 letter filed with FERC provided estimates for exposed littoral habitat at a 4.67 foot drawdown.
2)The current license for the Penobscot Mills Project allows for a drawdown up to 22 feet ( El.469.92') at the North Twin Impoundment; your September 30, 2021 letter filed with FERC provided estimates for exposed littoral habitat at a 2.83 foot drawdown.
3) The current license for the Penobscot Mills Project allows for a drawdown up to 6.2 feet ( El.473.8') at the Millinocket Lake Impoundment; your September 30, 2021 letter filed with FERC provided estimates for exposed littoral habitat at a 1.18 foot drawdown.

Clearly, vastly greater amounts of littoral habitat are exposed at each project impoundment at their lowest licensed elevations. I could not locate any estimates of littoral habitat exposed at the lowest licensed impoundment levels in VIII of the License Applications filed in December 1991 for the Ripogenus and Penobscot Mills Projects. If this information does not presently exist, it will be necessary to develop it for this relicensing.

Thank you, Jeff Murphy.

October 2, 2021

Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

RE: Comments on the PAD/Site Review for Ripogenus Hydroelectric Project (FERC No. 2572-133) from Kathleen K. Houston

Dear Secretary Bose:

After attending both Scoping Sessions and the Site Plan Review, I am writing to address concerns about misinformation presented and address inconsistencies from the previous licensing process. My concerns are as follows:

**Claims of stable water levels are simply not true. This instability greatly negatively impacts camp owners, recreationalists, and the ecological integrity of the area**

The PAD claims (pg 442),

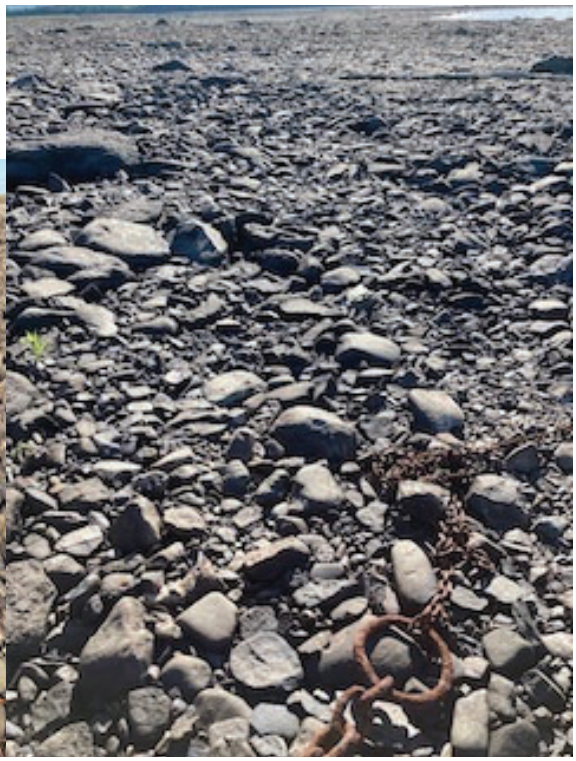
"*During normal operations and normal inflow years, the Ripogenus impoundment elevation is held relatively stable during the summer months and is gradually drawn down starting in the fall with a target low elevation by late winter in anticipation for the spring thaw and freshet."*

Lake levels have not been stable since at least 2003 and drawdown often begins in early summer.

As a camp owner unstable water levels have impacted my family significantly. It has rendered our dock and moorings unusable. We must now use three different moorings, each two hundred feet apart to be able to moor our boat from June - August. Our third mooring is over 600 feet from the high-water level mark and is currently unusable. Water levels fluctuate vastly during the summer months. It is extremely difficult to walk over this terrain, posing safely risks.

The images below illustrate some of the difficulties:





*Our first mooring August 2021 The second mooring high and dry*

A simple hand pump with a small hose easily pumped water from the nearby lake. Now, unstable lake levels render the pump unusable, and we needed to purchase a gas water pump and hundreds of feet of hose to get water from the lake, as the image below illustrates. *Water pump from lake to camp.. For scale, the white dot in front of camp is a person! August 2021*



**The public recreation experience is diminished**.

In the 1996 EIS, the Department of Conservation recognized …

*"the high quality resources….make the Ripogenus Project area one of the most important recreation areas in the state."*

This statement is still true today. Water fluctuations negatively impact the recreational lake user. Public campsites, required by the Applicants license, are hundreds of feet from the water, diminishing the aesthetics of the experience and increasing the difficulty of a trip. As a licensed Maine Recreational guide for over 30 years, I know how difficult it can be for visitors to the north woods to have to lug equipment and personal equipment over uneven, lengthy distances. Sites so far from the water are also a safety concern. It is very difficult to carry water for putting out fires over long distances and unstable terrain. Despite the hard work and efforts of the Department of Conservation staff, some sites are very difficult to use and access.




*The view from the lake to a public campsite. September 2021*

**The aesthetic experience of recreationists is diminished.**

The recreational importance of the Ripogenus project can't be overstated. The local economy depends on the boating, swimming, canoeing, and recreating public – a public that expects a visually pleasing surrounding. As the Environmental Statement (EIS) submitted in 1996 identifies,

"*Visual elements of the project area contribute to the quality of the recreational experience. Exposed rocky shorelines and stream beds can detract from the overall visual experience, particularly when associated with recreational use of the area."*

The images below document the current visual experience. Despite the beauty of Katahdin, the experience is diminished. Visitors to the lake have referred to the shoreline as a "moonscape."



*Is this the aesthetic quality we strive for in one of Maine's "gem" lakes? Sep 2021*

**Lack of Public Access Between Lakes.**

The Applicant's permit requires *"provisions to maintain appropriate public access."* Due to navigational hazards exposed by fluctuating water, access between lakes is nearly impossible as the images below confirm. This diminishes the angler's opportunities as well as the recreationists experience. *Caribou and Chesuncook Lakes Thoroughfare - 2020*



**Significant biological changes** are also taking place. At the Site Plan Review representatives implied the current water levels are an anomaly. Yes, there is a drought. However, my family remembers when all exposed littoral zone was rocky. Now, as the image below illustrates, hundreds of feet of shoreline are covered in plants and trees. This level of succession is not the result of a one, or even two-year drought. It is the biproduct of years of fluctuating water levels.



*September 2021*

**<u>Representation of boat landings at the Site Plan review, and in the PAD is vastly different than reality</u>**

The PAD (page 338) provides images of Chesuncook Boat landing and claims the site includes,

*"an improved gravel boat launch…..provides year-round access to Ripogenus impoundment for various recreation activities including boating, fishing, snowmobiling, and more,"*

as required by the project's license. The images below confirm the boat launch is not improved gravel, but instead a long, irregular, scree-like landscape that is difficult to navigate and treacherous on automobile tires. The shallow water makes it difficult, and sometimes impossible

to launch boats. You can see the images below are drastically different than those presented in the PAD. In addition, the boat landing has received no maintenance in over 10 years.



*The Chesuncook boat landing – August 2021.* *A close-up of the boat landing terrain*

**Claims of alternative boat landings and lake access are untrue.**

At the Site Plan Review representatives claimed the public could use a nearby private boat launch if the boat launch GLHA is obligated to provide becomes unusable. That is grossly inaccurate. The nearby private boat launch became unusable in August of this year and charges a fee.

In the 1996 Environmental Impact study, submitted by the applicant at that time, Commissioners were told,

*"Current operations of the Ripogenus impoundment results in annual water level fluctuations of as much as 44 feet. Since 1972, the maximum draw-down during the summer recreation period (between Memorial Day and Labor Day) has been 15.25 feet****: the average has been 3.5 feet (3.10.4.1).***

As the Impoundment Level chart below indicates, water levels did not fluctuate then as they currently do. The impact of facility operation can only be analyzed and mitigated with current, accurate data. Using thirty-year old data and studies to make a decision that will impact an entire region for the next 30 years is irresponsible and inadequate.




Figure E2-3 Ripogenus impoundment mean weekly water surface elevations for the period 1972-1985. Maximum and minimum daily recorded elevations during this period of record are noted on the figure.

Balance is essential to this large and complicated project, encompassing a variety of stake holders, for judicious use of the resource. Previous management of the facilities were able to meet this balance, providing for both downstream water needs including whitewater, waste management, and fisheries without significantly negatively impacting Chesuncook, Caribou or Ripogenus lakes. This is no longer the case, despite the rosy picture painted by GLHA. To fully understand the facilities impact on the lakes, the commission needs to have current, accurate, honest data to analyze.

**I respectfully request FERC require the Applicant provide stakeholders with ten years of operations data for the Ripogenus Project including impoundment elevation and daily outflows. This easily obtained data is necessary to gain an accurate understanding of the water bodies, and for fisheries and wildlife experts to identify neeeds. The public has a right to this information, and it is critical to any decision making.**

Previous decisions about the Ripogenus project were based on very different lake realities than experienced today, including the following statements and data:

1. quotes referenced above from the Environmental Impact study. *"Current operations of the Ripogenus impoundment results in annual water level fluctuations of as much as 44 feet. Since 1972, the maximum draw-down during the summer recreation period (between Memorial Day and Labor Day) has been 15.25 feet****: the average has been 3.5 feet (3.10.4.1)***

2. statements made about the WUP, *"the resulting Water Use Plan was included in the FERC relicensing and 401 certification…..The plan proposes no significant changes from the historic lake level management of Ripogenus Impoundment (1991)*
3. meetings between GNN and MDP in June of 1991 where:
    A. *"the MDEP expressed the position that the historic water management practices in the Ripogenus Impoundment may not be protective of littoral zone biota."* The concern must be much greater now.
    B. GNN *"proposes to continue drawdowns from the Ripogenus Impoundment seasonally as they have historically between normal high water elevation of 941.59 ft. and* ***an average drawdown of 20 ft****."* (pg 3 of meeting notes).
4. Charts of impoundment elevations from the time

The above data, combined with other information, influenced previous licensing decisions, and led to the current UAA. The current reality is vastly different. However, only personal anecdotal data exists as GLHA has not been willing to provide lake levels as the previous owner did.

**In addition to ten years of operations data including impoundment elevation, I strongly support the study requests submitted by the US Fish and Wildlife as they are the experts and need the studies to ensure the protection of water quality, fish and aquatic resources, endangered wildlife, and wetland, riparian and littoral vegetation.**

The Federal Power Act reminds us of the purpose of licensing in these words:

*"the Commission…give equal consideration to the power development purposes and the purposes of energy conservation, the protection, mitigation of damage to, and enhancement of fish and wildlife, the protection of recreational opportunities and the preservation of other aspects of environmental quality.." (section 4(e)10(a)).*

As this letter describes and documents photographically, damage has already been done. Additionally, fluctuating lake levels raise the potential for ongoing and future harm to fish, wildlife, and lake ecosystems, as well as negative economic impacts on this treasured recreational area.

There are few treasures that remain for everyone. Chesuncook, Caribou and Ripogenus lakes are just that. Steeped in tradition, home to generations of Mainers, and those from away, these gems must be protected. I urge you to consider the impact of your decisions, not just on its benefits to the hydroelectric project, but also on the long-term consequences to the lake, the rivers, the land, and our communities.

Respectfully,

Kathleen K Houston
58 Mystery Road
Kingfield, ME 04947
khlally14@gmail.com

October 2, 2021

Ms. Kimberly D. Bose
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

TROUT UNLIMITED
MAINE COUNCIL

**Via online submission to: http://www/ferc.gov (cross-filed)**

Subject: **Second Preliminary Comments of Maine Council of Trout Unlimited on the Notices of Intent and Pre-application Documents for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458)**

Dear Secretary Bose:

On behalf of its six chapters and over 2,000 members, Maine Council of Trout Unlimited (TU) submits these comments related to the Notices of Intent (NOI) and Pre-application Documents (PAD) for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) filed for Great Lakes Hydro America, LLC by Brookfield Renewable ("Brookfield") dated June 11, 2021,[1] TU's subsequent request for access to documents referenced in the PAD and a 90-day extension to review them,[2] the Brookfield responses and subsequent provision of a portion of the requested documents,[3] and the Commission's denial of the request for an extension.[4]

TU's request for referenced documents and a 90-day delay was in support of the initial request by NOAA Fisheries.[5] Information requests and a 90-day delay were submitted by the U. S. Fish and Wildlife Service (USFWS),[6] the Penobscot Indian Nation (PIN),[7] Maine Department of Marine Resources (MDMR),[8] and Maine Department of Inland Fisheries and Wildlife (MDIFW).[9]

[1] Brookfield Notices of Intent and Pre-application Documents for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) dated June 11, 2021.
[2] Maine TU Council letter Subject: Preliminary Comments of Maine Council of Trout Unlimited on the Notices of Intent and Preapplication Documents for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) dated September 16, 2021.
[3] Brookfield letter Subject: Ripogenus Hydroelectric Project (FERC No. 2572-133) Penobscot Mills Hydroelectric Project (FERC No. 2458-247) Response to Stakeholder Requests for Additional Information and an Extension of Time to File Study Requests and Comments on the Pre-Application Document dated September 17, 2021; Brookfield letter Subject: Ripogenus Hydroelectric Project (FERC No. 2572-133) Penobscot Mills Hydroelectric Project (FERC No. 2458-247) Supplemental Information – Source Information and Existing Studies dated September 24, 2021; FERC eLibrary download accessed at https://elibrary.ferc.gov/eLibrary/filedownload?fileid=000B4544-66E2-5005-8110-C31FAFC91712.
[4] FERC letter Reference: Response to Extension of Time and Additional Public Meeting Requests, and Request for Information for the Ripogenus Project No. 2572-133 and the Penobscot Mills Project No. 2458-247 dated September 28, 2021.
[5] NOAA Fisheries letter RE: Extension of Time Request for the Ripogenus (FERC No. 2572-133) and Penobscot Mills (2458-247) Hydroelectric Projects dated September 13, 2021.
[6] USFWS Letter RE: Extension of Time Request for the Ripogenus (FERC No. 2572-133) and Penobscot Mills (2458-247) Hydroelectric Projects dated September 14, 2021.
[7] Penobscot Indian Nation RE: Extension of Time Request, Data Request, Legal information request and repeat of the Public Scoping meeting request for the Ripogenus (FERC No. 2572-133) and Penobscot Mills (2458-247) Hydroelectric Projects letter dated September 13, 2021.
[8] Maine Department of Marine Resources letter RE: Extension of Time Request for the Ripogenus (FERC No. 2572-133) and Penobscot Mills (2458-247) Hydroelectric Projects of September 17, 2021.
[9] MDIFW letter RE: Extension of Time Request for the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458) dated September 17, 2021.

Brookfield's response described these requests as "*beyond the intent of 18 CFR §5.6(c)(2)*" yet Brookfield did subsequently provide the last license applications and supporting documents and a Use Attainability Analysis (UAA) for Chesuncook Lake. The TU request for documents was specific and is quoted below. Requests that were met by the documents that Brookfield supplied are indicated by strikethrough.

1. *(MDIFW 2012) - page 5-92*
2. *(FERC 1996) - page 5-92*
3. ~~*(GNNC 1991b) - page 5-93*~~
4. *(FishBase 2021c) - page 5-94*
5. *(GLHA 2011) - page 5-95*
6. *(MDMR 2021) - page 2021*
7. *(USFWS 2015a) - page 5-97*
8. *(Midwest Biodiversity Institute &Center for Applied Bioassessment and Criteria [MBI] 2005) - page 5-113*
9. ~~*During the previous relicensing of the Project, the Licensee completed an instream flow study in the Upper Gorge to assess the relationship between river flow and aquatic habitat - page 5-117*~~
10. *MDIFW unpublished sampling data from 2017 and 2018 - page 5-122 (footnote)*
11. *Yoder et al. 2008 (Source cited for Lower Millinocket Stream and West Branch (Millinocket Tailrace to Dolby Pond fish assemblage) - page 5-125*
12. ~~*Instream Flow Incremental Methodology (IFIM) study conducted by the Licensee in 1987 and 1988 in consultation with MDIFW and USFWS - page 5-127*~~
13. ~~*An additional IFIM study was conducted on the "deadwater" sections of Millinocket Stream to compliment the initial IFIM study - page 5-127*~~
14. ~~*IFIM Study (two sites) page 5-131*~~
15. ~~*(Nedeau et al. 2000) - page 5-133*~~
16. ~~*(Swartz and Nedeau 2007) - page 5-133*~~
17. ~~*(Swartz 2007) - page 5-143*~~
18. ~~(Dewan & Assoc., 1990b) - page 5-247~~

Please note that the documents that remain were produced subsequent to the last license applications and could not be part of the supplied documents. Of additional note is that item 10 is unpublished. These references do not appear in Brookfield's follow-on letter of September 24[10] that provided locations for referenced information. Footnote 1 on page 1[11] states: "*[1] Maine Council TU requests that the 1996 Final Environmental Impact Statement for the projects (FERC, 1996) be provided to all stakeholders. The document is available on the Commission's eLibrary site at https://elibrary.ferc.gov/eLibrary/filedownload?fileid=000B4544-66E2-5005-8110-C31FAFC91712* "

TU did not make this request, TU requested the specific documents listed above. The link the footnote provides is to the documents that Brookfield had already supplied.

The Commission's finding that the applicant was not required to provide the studies requested by agencies, PIN and TU will complicate agency efforts to identify data gaps. The task they face is daunting. Summary reports do not allow expert evaluation: they do not provide information on exactly where data was collected, methodology used, parameter ranges, assumptions, etc. As TU has previously stated, things were very different thirty years ago during the last relicensing when the electricity went directly

[10] Brookfield letter Subject: Ripogenus Hydroelectric Project (FERC No. 2572-133) Penobscot Mills Hydroelectric Project (FERC No. 2458-247) Supplemental Information – Source Information and Existing Studies dated September 24, 2021

[11] FERC letter Reference: Response to Extension of Time and Additional Public Meeting Requests, and Request for Information for the Ripogenus Project No. 2572-133 and the Penobscot Mills Project No. 2458-247 dated September 28, 2021.

to the mills in Millinocket. The power requirements were different, and many stakeholder comments have stated that the projects are now operated differently. Continuing low water levels on Ripogenus - Chesuncook Lake are striking. Climate change is likely an important additive factor to the apparent changes in project operations. Without detailed study information, the applicability of past studies is questionable at best.

**Trout Unlimited reiterates its support for the agency requests for refined data and asks that the Commission require that the applicant provide the information requested in electronic form *in advance of* the Proposed Study Plan Meeting along with the specific referenced studies that we requested, *so that we may understand the existing information before we must draft study requests*. TU additionally requests that FERC criteria for additional studies be applied more permissively than is generally the case to any requests that the agencies, PIN or NGO may submit later in the process when important information is still lacking.**

Maine TU Council appreciates the opportunity to provide these additional preliminary comments on these important projects and hopes that the Commission will act to allow the resource protection agencies to identify potential harms to the resource and thus enable the Commission to balance project harms and benefits.

Respectfully,



Stephen G. Heinz
Maine TU Council FERC Coordinator

Owen Genest, Sanford, ME.
My name is Owen Genest. I have been coming to the Chesuncook Lake region since the early 1990s. My grandfather has had a few camps off of Chesuncook Lake Rd, near the Boom House and forest ranger station. His current camp has the largest piece of waterfront land other than the Allagash Gateway Campground on the land leased by the Cushing family. Unfortunately for him and the rest of the family, the term waterfront isn't as accurate as it once was. Only for a very short window of time over the last few years could the lake be considered full. Usually its for the month of May into early June. This year however, the lake never got above somewhere around 8-10' below the normal high water mark, depending on the elevation that is considered. I understand the nature of the drought that the northern portion of Maine has gone through in the last couple years as well as the lack of snow pack above the lake. What I can't seem to understand is with those things considered, why does the Penobscot River below Ripogenus Dam stay well below standard water elevations. It would seem that if Chesuncook Lake was in such a significant state of drought that the lake is 20-25 ft lower than high water elevation, the river should follow suit and be flowing at a significantly lower flow velocity therefore having a much lower water level.

The water level has been concerning for a few years now during the fall, but it has been back up the following spring. This year was the worst yet. Normally a standard safe boating season on Chesuncook for someone that isn't very familiar with the lake goes from Memorial Day to July 4th. It can go longer, if one is prepared and familiar with the lake, but the nature of the lake is that there are many subsurface obstacles and hazards that are completely unmarked and invisible. 2021's boating season effectively never started. The water level at Memorial Day was approximately the same as the year prior's mid July. There is also no way to keep a functional dock or even mooring with the amount of fluctuation of the water levels of the lake.

This year's water level has made launching a boat a dangerous task, as the boat launch at the Boom House is passable when the water is high, but it is filled with jagged rocks that decimate even the most rugged tires. the average person not accustomed to the ways of the regions roads would not be able to recreate on the lake with an average vehicle as the launch is just too hazardous.

My grandfather has had him camp for sale for the last few years as he is getting older and he isn't using it as much anymore. I have given tours to many potential buyers over these years, and the biggest thing that has scared them away is the insane lake level fluctuations. One couple I talked to this spring loved the lake and the area as well as the camp, but couldn't wrap their heads around the idea that sometimes the lake is just 20' low and effectively impassible via boat. The lake level fluctuations have actively hurt his ability to sell the camp to the point that he has just decided to keep it in the family as he can't see it go for less than it's worth due to the water levels.

My education is in Civil and Environmental Engineering with a previous path in Biology. I am genuinely concerned about the ecological and biological ramifications

of the lake fluctuation and especially as low s the water is this year.  Last year, I drove around the north end of the lake, where Umbazooksus Stream comes into the lake and it was dry.  I'm not sure of the spawning habits of the native fish in Umbazooksus Stream, but I would be concerned about their ability to mate and spawn in any dry body of water.  The water being low also makes it more difficult for large ungulates to safely go to the lake to drink and eat aquatic plants.  Coyotes are notoriously clever and know that with no cover and over jagged rock, the deer and moose have no chance near the water.

What I would like to see moving forward, would be for FERC to require Brookfield to submit impoundment level data for the last 30 years.  This would provide actual data to mine and others arguments.

I would also like to see an actual boat launch maintained yearly at both the Boom House and on Caribou Lake.  This would allow for recreation opportunities for all.

The lake needs to have navigational hazards marked with buoys at a minimum and make sure they are maintained yearly as well.  This will at least provide a modicum of safety and usability for the lake for those that may not have 30 years of experience on the lake.  This summer I went with friends that had never been and they remarked that they would never try to navigate that lake without someone who is familiar with it present.

I would also like the state biologists to perform spawning studies of brook trout and salmon to ensure they are still breeding and maintaining a healthy population.

Thanks for your time,

Owen Genest
13 Maplewood Dr
Sanford, ME

October 5, 2021

***Via Electronic Filing***

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Comments on Scoping Document 1**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), a subsidiary of Brookfield Renewable and Licensee of the Ripogenus Hydroelectric Project and Penobscot Mills Hydroelectric Project (collectively referred to as the "Projects"), herein files comments on Scoping Document 1 (SD1).

On June 11, 2021, GLHA filed the Notices of Intent and Pre-Application Document (PAD), which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through the Federal Energy Regulatory Commission's ("FERC" or "Commission") Integrated Licensing Process (ILP). Based on the ILP regulations and the Process Plan and Schedule provided in the PAD, FERC issued SD1 on August 10, 2021.

Based on a review of SD1, GLHA submits the comments described below with new text shown in *italics* and deleted text shown in ~~strikethrough~~.

1. Page 14: GLHA notes a correction needed to the last sentence on page 14 regarding the Millinocket Development: "Water exits the turbines through seven, 25-foot-wide tailrace bays that discharge directly to ~~the West Branch~~ *Millinocket Stream and then flows downstream into Shad Pond and the West Branch*."

2. Page 16: GLHA notes the following clarification as it relates to the last paragraph on page 16 regarding the Dolby Development: "The power generated by the Dolby Development is transmitted to the grid via an adjacent substation that contains two transformers and a 2-mile-long transmission line that extends to GLHA's Substation #5 *(also referred to as the Powersville Substation) located adjacent to the East Millinocket Development*. *Additionally, a second transmission line extends approximately 5 miles from the Dolby substation to the former Millinocket Mill, but is currently out-of-service."*

3. Page 18: GLHA notes the following correction to the last sentence in the third paragraph on page 18 regarding the East Millinocket Development: "From the transformer, power is transmitted to Substation #5 *(also referred to as the Powersville Substation)* via a ~~2-mile-long~~ *2,000-foot-long* transmission line."

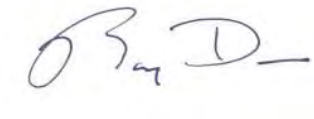
Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462
www.brookfieldrenewable.com
Tel: 207.723.4341
Fax: 207.723.3948

4. Page 20: GLHA notes the following clarification to the text in the second paragraph on page 20 regarding the Penobscot Mills Project recreation facilities: "The Green Bridge Boat Launch is located ~~at the Millinocket Development~~ *downstream of North Twin Dam on the West Branch of the Penobscot River and within the Penobscot Mills Project boundary. It provides boating access both downstream to Quakish Lake (Millinocket impoundment) and upstream to North Twin Dam*."

GLHA also notes that Table 4.2-1 of the PAD (page 4-2) should state that the Millinocket, Dolby, and East Millinocket Developments are located in Penobscot County.

If you have any questions regarding this information, please contact the undersigned at (207) 775-5605 or randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman
Licensing Manager, Brookfield Renewable

Ryan Gerry, Hermon, ME.
I am Maine state resident and a regular recreational user of the West Branch of the Penobscot. This waterway is a tremendous resource. The camping and whitewater rafting/kayaking is among the best in the country.

The dry-way above Ripogenus dam is an untapped resource that holds great potential. Scheduled releases would be a major draw among the whitewater community and could potentially hold commercial value for guided raft tours. Please consider including scheduled dry-way releases for recreational use as a condition of the dam relicensing.



Document Accession #: 20211007-5081 Filed Date: 10/07/2021



Document Accession #: 20211007-5081 Filed Date: 10/07/2021



Document Accession #: 20211007-5001 Filed Date: 10/07/2021







peter forti, norfolk, VA.
Project Number: 2572-133, Docket Number: P-2572 and Sub Docket Number: 133

As a long time land owner of 42 years, at the junction of lake caribou and ragged stream, I have witnessed the steady decline of water levels over the years at the early stages of summer and fall seasons. This has resulted in the loss of our recreational activities (ie: boating, canoeing, fishing, swimming etc…). It has also impacted wildlife as they use this area for their survival. Particularly Eagles, osprey, herons, loons  and other birds that rely on high water levels for their food supply, as well as land animals for drinking water.

As a tax payer, I am seeing diminishing use of the lake but increasing tax hikes with no communal services at all. The least GLHA can do is keep the water levels up till end September early October.
We all know that the more water pumped out the more money that Great Lakes Hydro America makes at our expense with no regard to anyone or anything or the lakes  they are depleting.

Therefor, I would also recommend that a forensic study be performed to evaluate this company's internal operating structure and procedures and determine if changes can be effected. If they continue to release water levels to bare minimums for profit, then we should be granted tax breaks??? However, I would be happy to pay my fair share of taxes if we can enjoy the land and lake, and all that it has to offer, that we originally paid for as it was intended for recreational purposes.

Therefore, before any license/permit is granted for the next 35 years I request that GLHA keep water levels at higher levels thru October of each year.
Maybe a request for additional bids should be requested?

Sincerely and on behalf of other surrounding owners.

Peter Forti
516-241-1620 cell
Email: granby@ cox.net

Project Number: 2572-133, Docket Number: P-2572 and Sub Docket Number: 133

Alexandra L Horne, Oak Hill, WV.

Part 1:
As a director of the Maine Whitewater Championship whitewater kayaking race series in Maine, I help organize a race on the West Branch of the Penobscot each summer. I have held this role for three years, and am also an avid whitewater kayaker and registered Maine Guide. The Maine Whitewater Championship is one of New England's largest whitewater races, and brings recreational boaters to this iconic section of river every year for a weekend of paddling and community. Over the past two years participation has increased and we're seeing paddlers from different areas in the country travel to northern Maine to partake in this event.
I have personally seen the high esteem that whitewater enthusiasts from all over the country hold the West Branch of the Penobscot to. They love this river for its pristine beauty, clean water quality and phenomenal whitewater. This area is a hidden gem, with the local economy ready for the tourism that the Penobscot River and surrounding Baxter State Park can bring to the area. This wonderful natural resource we have could grow to be a popular destination for outdoor recreation, with the proper investment.
By adding recreational releases to the Dryway, a section of world-class class IV/V whitewater, an incredible stretch of navigable whitewater would become available to paddlers. This section contains quality whitewater that locals have paddled for several yeras. Adding days where increased flows could be released through the Dryway section of the Penobscot would draw more paddlers to the Penobscot and would benefit the area greatly. This section of whitewater has been paddled at several different flows, of which many paddlers have a favorite. A flow study would be beneficial to best determine a flow that would be appropriate for kayakers, rafters and fishermen alike, taking into consideration the optimal flows for natural inhabitants of the riverbed.
In addition, releases on the Backbend section and Millinocket Stream would allow for inclusion of recreational boaters looking for class II/III whitewater paddling in this area. These sections do not run often but are popular to those who have had an opportunity to experience them. Adding to the variety of difficulty that the Penobscot area offers, will support and allow recreational boaters of all skill levels a section of the river to enjoy.
Part II: Request for study of Dry Way section of whitewater below Ripogenus Dam

Goals: To better understand minimum flows required for kayak and raft passage

Objectives:
A)Obtain minimum CFS required for kayak and raft passage.
B)Obtain a ideal CFS for kayak and raft passage
C)Obtain a ideal flow for commercial rafting

Public Interest:
A)Finding flows that accommodate all experience levels of whitewater boaters.
B)Find flows that accommodate and support native fish habitat
C)Both public and private boaters will come to the area for recreational releases, boosting the local economy which is heavily reliant on outdoor recreation.

D)Add to the iconi class IV/V section of the West Branch of thye Penobscot by 1 mile.

Existing & needed Information
B) Need proof that dryway is navigable
C) Create info about the difficulty of the whitewater according to flow that is available for all recreational boaters.

Proposed Methodology:
A) Schedule a day or days where Brookfield Releases 300,500,1000,1500,2000,3000cfs out of Ripogenus Dam for observation of best flows. Announce this day to allow kayakers, rafters and professional safety to be available and present to assess rapids and hazards at all flows.
C) Have a meeting and survey conducted to organize results.

Media of Upper Gorge (dryway):
https://youtu.be/hi_DS4mmYMM?t=557
https://youtu.be/t0Q_nXOTmSY?t=929

Thank you for your time,

Alexandra Horne, OD FAAO

andrew s taber, South Dartmouth, MA.
To whom it may concern.

I Andrew Taber am writing to you today in regards to the watershed of chesuncook, ripogenus, and caribou lakes. I am a camp owner with a cabin on ripogenus lake. I have about 600ft of lake frontage on the lake. Due to the water level being around 22 ft low on a vertical scale the shore line is about 400 ft from the spring high water mark. I have built a dock two years ago and have not been able to use the dock due to extreme low water levels. The spring of 2021 the lake system was 7ft low on the vertical and for some reason was not allowed to brought up to the spring high level. With ripogenus damn being up for a new lease hopefully there will be literature from FERC to have regulations of the draw of the water from this lake system that can be managed better with the conditions that we all face with these changing times. The boat ramps on the lakes are at this time boarder line un useable. The chesuncook boat ramp is about 400 ft from spring high water. To access the water one needs to drive down the lake bottom over rocks and shale. There is no sign of there being a kept up boat ramp at this spot which should be serviced yearly. The caribou lake boat ramp is by no way any better. The public camp sites that are located remotely along the lakes are on average 200 ft from the lake. This makes for the usage of these sites to be a hazard to personal injury and also to ones boats and or canoes. The passage from the shorelines to each site offers different difficulties including grasses covering the jagged lake bottom, sand, silt, and mud. Rocks and shoals are a hazard to boats and boat motors. There are rocks sticking out of these lake that are normally under spring high water conditions that are normally 20ft under water. This is extremely dangerous even for the seasoned veteran of these lakes. Property values have been impacted as usage in the summer offer little to no lake access du to extremely low water levels. FERC needs guidelines to limit the over usage of a precious recourse needed and used from all the landowner, animals, fish species, plant species and the public that frequent this beautiful place in the state of Maine.

RUDMAN • WINCHELL

Allison A. Economy
(207) 992-2413
aeconomy@rudmanwinchell.com

October 7, 2021

*Via Electronic Submission* (http://www.ferc.gov/docs-filing/ecomment.asp)
Ms. Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426

**RE: Ripogenus Hydroelectric Project (P-2572-133)**

Dear Ms. Bose:

This submission is offered on behalf of William Cushing ("Mr. Cushing") and Allagash Gateway Campground ("Allagash Gateway") in response to the request of the Federal Energy Regulatory Commission ("Commission" or "FERC") for information, comments, and study requests related to the Ripogenus Hydroelectric Project (P-2572-133) (the "Project").

Mr. Cushing is a director of Andre Emerson Cushing Corporation, the majority landowner in T3 R12 WELS. Approximately 80% of Ripogenus Lake and 20% of Chesuncook Lake are within the boundaries of T3 R12 WELS. Mr. Cushing is a year-round resident of T3 R12 WELS, and his home is on Ripogenus Lake.

Allagash Gateway is a four-season sporting camp located on Ripogenus Lake near the Chesuncook Dam Point Boat Launch. It offers a private boat launch, canoeing, campsites, lodging, guide services, and a small store. During the summer months, Allagash Gateway's clientele are primarily interested in boating and fishing the lakes that make up the Ripogenus impoundment.

As more fully set forth herein, Mr. Cushing and Allagash Gateway have faced dire consequences based on the unregulated elevation of the Ripogenus impoundment. Specifically, boaters and anglers are unable to access Ripogenus, Chesuncook, and Caribou Lakes, thus precluding certain recreational opportunities in the region, negatively impacting the ability of Allagash Gateway to conduct its business and driving down the economy of this rural area.

## A. Recreational Opportunities in the Ripogenus Impoundment

Great Lakes Hydro America, LLC ("GLHA"), a subsidiary of Brookfield Renewable and Licensee of the Project, submitted its Pre-Application Document ("PAD") on June 11, 2021. In the PAD, GLHA expressly recognizes that "[r]ecreation represents one of the most important economic drivers for the region." (PAD, Section 5.8.1).

These recreational opportunities, as discussed in the PAD, include (a) FERC-approved Project recreation sites, (b) formal and informal non-project recreation sites, and (c) commercial recreational opportunities.

### a. FERC-approved Project recreation sites

The PAD recognizes that "[t]he Ripogenus Project has several formal FERC-approved Project recreation sites which provide opportunities for fishing, swimming, boating, hunting, ice fishing, camping, hiking, snowmobiling, canoeing, cross-country skiing, waterskiing, sailing, and sightseeing. These include one boat launch, one boat put-in, several campsites, rafting put-in facilities at McKay Station, and one trail (Table 5.8-1 and Figure 5.8-3)." (PAD, Section 5.8.2.1).

Among these FERC-approved Project recreation sites is the Chesuncook Dam Point Boat Launch. This launch is located on the Ripogenus impoundment (Chesuncook Lake basin) on Chesuncook Lake Road off the Golden Road. It is a single-lane gravel boat launch, with parking for multiple trailered vehicles. It was established as a requirement of the 1996 FERC License, and it is managed by the Penobscot River Corridor.

### b. Non-project recreation sites

The Project and surrounding areas also provide vast amounts of recreational opportunities utilizing both formal and informal non-project recreation sites. Along the Golden Road, which follows the Ripogenus impoundment (Chesuncook Lake), there are many informal recreation sites and pulloffs that provide public access to Project lands and waters. This is also true for the impoundment itself. With vast areas of undeveloped lake and riverfront, recreational users within the Project area frequently utilize informal recreation sites along the shoreline and within the drawdown zone, and they use informal beach areas for swimming, picnicking, fishing and camping.

### c. Commercial recreational opportunities

While the most widely discussed commercial recreational opportunities within the Project and surrounding areas pertain to the whitewater rafting industry, there are multiple commercial recreational opportunities outside of the rafting industry. One such opportunity is Allagash Gateway, which provides lodging and guide services to anglers in the Maine North Woods. Like the whitewater rafting companies, Allagash Gateway is dependent on the water system of the Ripogenus impoundment to serve its recreational clientele.

## B. Effect of unregulated elevation of the Ripogenus impoundment on Recreational Opportunities

The unregulated elevation of the Ripogenus impoundment has had a negative effect on the recreational opportunities within the Project and surrounding areas.

As set forth in the PAD, "[t]he Ripogenus Project operates as a store-and-release facility with an annual seasonal drawdown that allows for management of water levels and flows downstream of the project. The normal full pond elevation of the Ripogenus impoundment is 941.6 feet, with a

maximum drawdown of 44 feet (based on operational limitations of the project)." (PAD, Section 3.1.3).

According to the PAD, "[d]uring normal operation and normal inflow years, the Ripogenus impoundment elevation is held relatively stable at 941.6 feet during the summer months and is gradually drawn down starting in the fall, with a target low elevation of 913.6 feet by late winter, in anticipation of spring thaw and high flows. This operation results in a target seasonal drawdown of 28 feet." (PAD, Section 3.1.3).

Mr. Cushing has resided year-round on Ripogenus Lake for more than a decade. In the 11 years that he has been a year-round resident, he has witnessed a draw down each summer of approximately 15 feet. Thus, if the normal full pond elevation is 941.6 feet by late spring, the Ripogenus impoundment is down to 926.6 feet within three months thereafter.

In 2021, the three-month summer draw down was the usual 15 feet; however, the Ripogenus impoundment did not start at normal full pond elevation of 941.6 feet in late spring. Rather, the impounded started at a 10-foot deficit, closer to 931 feet.

From the very start of the 2021 fishing season, this 10-foot deficit has wreaked havoc on the recreational opportunities within the Ripogenus impoundment.

Specifically, the National Resource Education Center hosted the annual Chesuncook Lake Salmon Derby (the "Derby") on May 29 and 30, 2021. The primary purpose of the Derby is for anglers to harvest salmon under 16 inches to thin out the over-abundant population that dominates the lake. In addition to being a useful fisheries management tool, the Derby is an economic driver, bringing anglers to the region for a weekend event.

This year, Derby participants were hampered by low water levels. The Chesuncook Dam Point Boat Launch was not a viable option for launching boats into Chesuncook Lake, since water levels were still too low to put in a boat at that location.

Fortunately, Allagash Gateway got just enough rain to put in its docks on May 28, 2021, just one day prior to the Derby. Absent the fortuitous rainfall, and without Allagash Gateway providing access via its private boat launch, the Derby would not have been able to take place as scheduled.

Unfortunately, the fishing season was short lived. Boaters were able to use the Chesuncook Dam Point Boat Launch for a brief period of time during the month of June 2021, but that was it. The last attempted boat launch (which was unsuccessful) took place on July 6, 2021. By then, water levels were already too low to access Chesuncook Lake at the public launch.

Allagash Gateway was able to provide access to Ripogenus Lake for a short period of time thereafter, but by the end of July, Allagash Gateway had no choice but to pull its docks for the season because water levels had continued to decrease. Allagash Gateway had to face disappointed clientele who came to fish, some even trailering boats long distances, only be told that there was no way to launch their boats within the Ripogenus impoundment by August. Other clientele, who historically came every year to fish in mid-to-late summer and early fall, canceled their reservations as a direct result of the inability to launch their boats. For a campground that is dependent on anglers during the summer months, this was devastating on all levels.

**Current Elevation of the Ripogenus Impoundment**

As of September 8, 2021, the Ripogenus impoundment was down 28 feet from the normal full pond elevation, to approximately 913 feet. With seven months of draw down left to go, the elevation levels are of great concern. The following are photographs of recent current conditions, along with a Google Maps image included for context.

Photo 1:

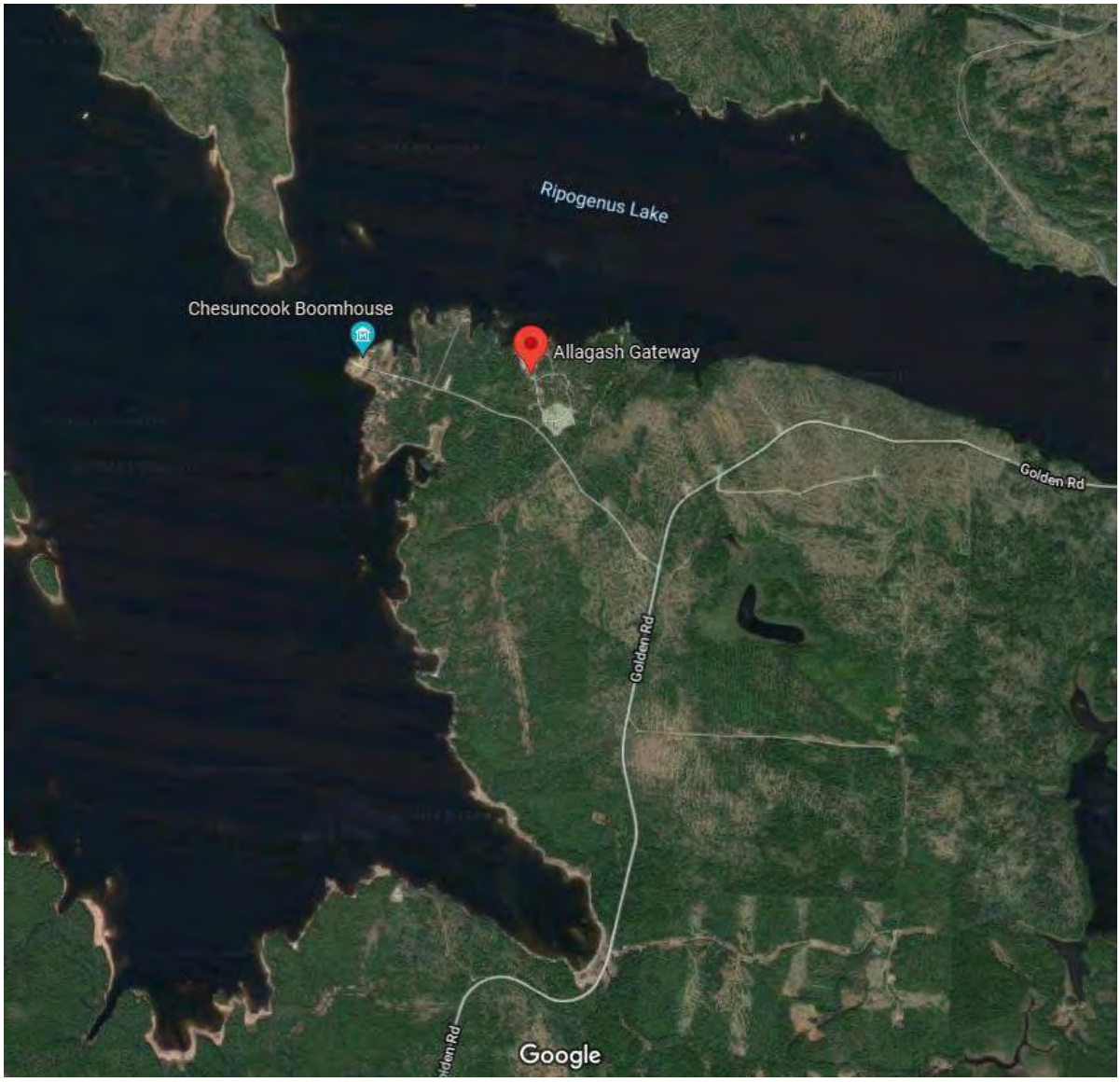



Photo 1 is a Google Maps image depicting the location of Allagash Gateway and its surrounding area. The Chesuncook Dam Point Boat Launch is just to the south of the Chesuncook Boomhouse. The channel between Ripogenus Lake and Chesuncook Lake is to the north of the Chesuncook Boomhouse. Mr. Cushing's house is on Ripogenus Lake between the Chesuncook Boomhouse and Allagash Gateway. The south cove of Chesuncook Lake, as depicted in Photo 11, is at the bottom center of the image.

Photo 2:



Photo 2 was taken on September 8, 2021. It depicts the marina at Allagash Gateway. The docks were pulled out at the end of July. Mr. Cushing, who took the picture, was standing in an area that should be covered in water.

Photo 3:



Photo 3 was taken on September 8, 2021. It depicts the marina at Allagash Gateway. Mr. Cushing, who took the picture, was standing in an area that should be covered in water. The high water mark is visible above the canoes on the right.

Photo 4:



Photo 4 was taken on September 8, 2021. It depicts the Chesuncook Dam Point Boat Launch. Mr. Cushing, who took the picture, was standing at the high water mark. He estimates that it was approximately 80 yards from the high water mark to the edge of Chesuncook Lake.

Photo 5:



Photo 5 was taken on September 17, 2021. It was taken from the west end of the channel between Ripogenus Lake and Chesuncook Lake depicts and depicts Mr. Cushing's house. The high water mark is the tree line in front of his house.

Photo 6:



Photo 6 was taken on September 17, 2021. It depicts Mr. Cushing's house in the upper left corner, from the west end of the channel between Ripogenus Lake and Chesuncook Lake. There should be 10 additional feet of water in the channel, covering all of the rocks.

Photo 7:



Photo 7 was taken on September 17, 2021. It depicts the west end of the channel between Ripogenus Lake and Chesuncook Lake, looking east with Spencer Mountain in the background.

Photo 8:



Photo 8 was taken on September 17, 2021. It depicts the west end of the channel between Ripogenus Lake and Chesuncook Lake, looking east with Spencer Mountain in the background. The rocks on the right of the photo are from the old dam.

Photo 9:



Photo 9 was taken on September 17, 2021. It depicts the west end of the channel between Ripogenus Lake and Chesuncook Lake, looking north.

Photo 10:



Photo 10 was taken on September 17, 2021. It was taken in front of Mr. Cushing's house and depicts the west end of the channel between Ripogenus Lake and Chesuncook Lake.

Photo 11:



Photo 11 was taken on September 27, 2021. It was taken from the Golden Road and depicts the Chesuncook Stream outlet at the southernmost point of Chesuncook Lake. The entire south cove of Chesuncook Lake is dry.

**C. Coordination with Upstream Storage and Requested Studies**

The Ripogenus impoundment elevation is based on a number of factors: "In the spring, the Ripogenus impoundment elevation rises based on inflows from the upstream Storage Project No. 2634, spring thaw, and precipitation, with the goal of reaching 941.6 feet by late spring." (3.1.3).

Mr. Cushing and Allagash Gateway would like to see better coordination with upstream Storage Project No. 2634, particularly in years following a drought or below-normal snowfall levels, to ensure that the Ripogenus impoundment elevation reaches normal full pond elevation of 941.6 feet by late spring and is held relatively stable at 941.6 feet during the summer months. Rather than have this be a "goal" of GLHA, Mr. Cushing and Allagash Gateway would like to see it be a condition of renewal and a license requirement.

To that end, Mr. Cushing and Allagash Gateway would request a review of studies and/or data for the last 10 years for the Ripogenus impoundment showing the high level elevation in late spring, the elevation following the three-month summer draw down, and the low level elevation in winter.

Mr. Cushing and Allagash Gateway understand that Ripogenus Project operators balance downstream flows and water levels to support flood control, public safety, dam safety, supplemental flows during seasonal low-flow periods, fish spawning and migration, recreation and whitewater boating, water quality, and generation needs, but this cannot be to the detriment of those who rely on adequate impoundment elevation for recreational opportunities, which opportunities GLHA expressly admits represent one of the most important economic drivers for the region.

Accordingly, Mr. Cushing and Allagash Gateway would request that GLHA conduct a study on the impact of its draw downs on recreational opportunities in the Ripogenus impoundment and the corresponding effect of any resulting limitations on the economic climate within the region.

Thank you for your time and consideration.

Yours truly,

*/s/ Allison A. Economy*

Allison A. Economy

Benjamin Koehler, Orono, ME.
Hello, my name is Benjamin Koehler, lifelong Mainer, and Whitewater Guide on the West Branch of the Penobscot. I am writing today concerning the relicensing of the Ripogenus Dam, the Millinocket Stream Dam, and the Penobscot Mills projects. Each of these projects regulates the flows for sections that have significant recreational, aesthetic, and cultural resources.

Below the Ripogenus Dam is the Dryway, some of the best class 4/5 whitewater in the northeast. The Dryway is dewatered by the operation of McKay Station and currently has no release schedule. Millinocket Stream has several miles of quality class 2 and 3 whitewater, perfect for teaching beginners, and it conveniently ends right in Millinocket. There is currently no release schedule on this section, and much of the water is pumped from Millinocket Lake into Pemadumcook Lake to be used in the Penobscot Mills projects. The Backbend (the dewatered section between Quakish Lake and Dolby Pond) has excellent wilderness character despite being close to town, a long class 3 rapid, and a 10 foot waterfall that is a significant aesthetic and recreational resource. This section currently has no release schedule, and almost never runs from natural flow due to the water being used by the hydro project at the Millinocket Mill site.

Video detailing the quality whitewater of the Dryway:
https://youtu.be/t0Q_nXOTmSY?t=929

I would like to request a whitewater boating flow study on each of these 3 sections.

The goal of these studies would be to find the minimum boatable flows for whitewater recreation, the ideal flow for whitewater recreation, and the high water limit for whitewater recreation. This information would guide FERC in establishing a sensible release schedule for these sections.

I am not a resource management agency.

These studies would meet the whitewater community goals of having quality class 5 whitewater (The Dryway), safe class 3 whitewater (The Backbend and Millinocket Stream), all within a short drive from Millinocket.

There have not been whitewater boating flow studies on these sections, so the existing knowledge is the experience of the local boaters who have run these sections. The studies would combine this knowledge with new boaters' impressions of the rapids, giving us information about the rapids at a variety of levels, from a variety of perspectives.

Each of these hydro projects directly regulates the flow downstream of the project.

The dewatering of the Dryway, Backbend, and Millinocket Stream renders the recreational resources unusable, as the minimum flows as stated by the current licenses are not high enough to be boatable. These studies would inform FERC in establishing a release schedule that would make these resources available for the public to enjoy.

Dryway: Gather boaters to run the section at a variety of flows; 1200 (CFS), 1600, 2000, 2400, 2800, 3200. This flow range covers what we know to be the runnable levels for this section. After all the levels have been run, the participants convene to take a survey to gather their impressions.

Millinocket Stream: Gather boaters to run the section at a variety of flows; 400 (CFS), 600, 800, 1000, 1200, 1400. After all the levels have been run, the participants convene to take a survey to gather their impressions.

Backbend: Gather boaters to run the section at a variety of flows; 1200 (CFS), 1600, 2000, 2400, 2800, 3200. This flow range covers what we know to be the runnable levels for this section. After all the levels have been run, the participants convene to take a survey to gather their impressions.

Each of these studies could be accomplished in one day, at a low cost as the whitewater boaters will volunteer their time. American Whitewater often has a role in organizing these flow studies, and can get a sufficient number of volunteers to participate.

-Thank you for your time

Benjamin Koehler

October 7, 2021

Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E. Washington, DC 20426

RE: Comments on the PAD for Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458) from the Caribou and Chesuncook Lake Camp Owners Association and the Chesuncook Dam Camp Owners Association.

Dear Secretary Bose:

On behalf of the members of the Caribou and Chesuncook Lake Camp Owners Association and the Chesuncook Dam Camp Owners Association, I am submitting these comments on the Pre-application Documents (PAD) for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) filed for Great Lakes Hydro America, LLC by Brookfield Renewable ("Brookfield") dated June 11, 2021.

The two Associations represent over fifty camp owners with a significant and substantial interest in the relicensing of these projects. We have a deep love for and knowledge of, Caribou, Chesuncook, and Ripogenus Lakes, all natural lakes interconnected and level controlled by Ripogenus Dam. We all have a large financial and time commitments to our properties. Many of our members have long multi-generational histories on the lakes and know them well before and after the current operator and applicant. It is our observation that Brookfield Renewable is operating Ripogenus Dam vastly differently than it was operated for its previous eighty-year history and now believe that lake level parameters are necessary for the health of the lakes, the aquatic species that inhabit them, as well as the recreational use of the lakes.

The most obvious sign of a significant change in operation and evidence of long-term lake drawdown during the growing season, and the corresponding recreation season from what is traditionally Memorial Day weekend to the end of September, is the complete transformation of the littoral zone to full primary succession. Compared to the last relicensing, when the littoral zone would be rocky shore and exposed lake bed, there are now, in many places hundreds of feet of grass and other primary succession plants. There are willows and alders growing far from the high-water line. We are sensitive to the drought of the last year but these changes are the direct result of a continuous and persistent drawdown.



*Figure 1 Littoral Zone Chesuncook Lake*

This is in contrast to the PAD which states;

*During normal operations and normal inflow years, the Ripogenus impoundment elevation is held relatively stable during the summer months and is gradually drawn down starting in the fall with a target low elevation by late winter in anticipation for the spring thaw and freshet.*

Stable lake levels near full pond level during the recreation season are the norm throughout impoundments all across Maine. The North Twin Lakes are required to be within one and a half feet of full pond from Memorial Day until the end of August and no more than 3.5 feet by October. Other lakes in Maine have similar drawdown restrictions. According to the PAD, Chesuncook Lake can be drawn down up to 44 feet from full pond at any time of the year, which is not a permit restriction merely a design restriction. For the past two recreational seasons the lakes in the Ripogenus Impoundment have seen drawdowns of approximately 20 feet by Labor Day which had significant negative impacts across all uses of the Lakes.

The boat launches become almost unusable, there are numerous navigational hazards, boat travel between Caribou, Ripogenus and Chesuncook Lakes becomes impossible, docks and moorings are dry, water lines to our camps are dry, and camps and campsites are hundreds and in a few

cases thousands of feet from the water. It is not hard to imagine that there is a significant loss to property values with large drawdowns during the recreational season. We understand that during a drought year full pond levels are more difficult to maintain, but there have been many days that flows from Ripogenus Dam far exceeded the minimums required for downstream commitments to the rafting industry and for fisheries. We observe that no matter what the hydrological conditions, the lakes are in a perpetual state of drawdown other than at spring freshet.

Additionally, there have been multiple years over the last twenty years when the lake never reaches full pond after the spring freshet. We understand that there will be times of near full pond given factors out of the applicants control but instead of a target drawdown of 28 feet as stated in the PAD,

*Normal full pond elevation of the Ripogenus impoundment is 941.6 feet with a maximum drawdown of 44 feet (based on operational limitations of the Project). During normal operations, the Ripogenus impoundment is maintained between normal full pond elevation (941.6 feet) following seasonal inflow to the impoundment and a target elevation of 913.6 feet prior to the seasonal inflow, which equates to a target seasonal drawdown range of 28 feet.*

drawdown should be targeted to a full pond in the spring based on the current snowpack as reported by Maine's detailed and weekly snow survey and historic averages of spring rains. This past year and others the lake has been down significantly at Memorial Day.

We also question the PAD's assertion that;

*In response to the filing of the periodic recreation monitoring reports, FERC concluded that the facilities at the Ripogenus Project <u>are meeting the needs of the public</u> and that the Project does not require additional recreation facilities (FERC 2002, 2009, 2015).*

given that both the Caribou and Chesuncook boat launches have not been maintained in years and are in reality nothing more than rocky paths to the water that often become unusable at the lake levels we have seen under the current applicant's operation of Ripogenus Dam. We would ask the FERC require standards for the boat launches and required annual maintenance for them.



*Figure 2 Chesuncook Lake Boat Launch, September 2021*

We believe that many of the studies and data collected for the previous relicensing are totally out of date given the change in operation and the extremely low lake levels we have seen. Therefore, we fully support the requests of NOAA, US Fish and Wildlife, Maine Inland Fisheries and Wildlife, and others that the applicant provide impoundment and flow data. We ask that current studies be made to fully access current conditions including and not limited to

- Reservoir Water Level Fluctuation/Operation Model Study
- Reservoir Surface Area Assessment Study
- Shoreline Management Assessment Study
- Recreation Study that includes both lake and river use
- Littoral Habitat Assessment Study

We also believe that the current Use Attainability Analysis (UAA) for the Ripogenus impoundment was based on data that is out of data where a summer recreation season drawdown was only 3.5 feet on average. With current drawdowns far exceeding that average, the UAA needs to revisited and updated.

There may well be further studies needed based on the conditions of the Lakes and River today so that an appropriate permit may be issued that meets the needs of the applicant as well as the people of Maine, and we encourage FERC to ensure those are done as well.

Thank you for the opportunity to provide our initial comments on the PAD.

Respectfully,

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association
Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947
bhoustonps@gmail.com

Earle R Fayle, Medway, ME.
I have been a camp owner on Ripogenus Lake since 2000 and have had a camp in the family on Chesuncook Lake since 1965. The water levels on the lakes have been very inconsistent and in the past 2 years have been excessively low.
The ecological impact on the watershed as well as the recreational activities have been negatively impacted. Navigational hazards, boating opportunities, ability to dock and non-potable water use have been a problem due to low water levels. GLHA has to do a better job of maintaining water levels at a higher mark. I realize it is a balancing act dealing with flows but more consideration has to be taken for camp owners in the watershed.

Sincerely,

Earle Fayle







October 7, 2021

Dear Secretary Bose:

My name is Jeff Fayle and I am writing in reference to docket # 2572. I have been a part-time resident at Chesuncook Lake for 59 years. As a youth, my family spent summers and weekends there. As an adult, I have spent an average of 7 - 8 months of the year in residence at the lake. Chesuncook is my home, and I am writing to document my concerns regarding the fluctuating water levels that result from the operation of Ripogenus Dam.

The Electric Consumer Protection Act of 1986 required FERC to give *BALANCED* consideration to both the developmental and non-developmental values in the hydro licensing process. In addition, the relicensing process is required to include a detailed environmental assessment of the impacts on fish and wildlife habitat, water quality, land use, and recreation, as well as other areas of concern. Yet to my knowledge the last assessment was completed in 1996. GLHA claims in the PAD that no significant changes have occurred since the previous relicensing. However, I can assure you that the changes to Chesuncook since 1996 are vast and transformational to the ecology and dynamics of the lake. I will break down my concerns into four categories:

1. Ecological Changes

2. Navigational Access and Safety

3. Impacts on Fishing and Recreation

4. Personal Observations

**ECOLOGICAL CHANGES DUE TO FLUCTUATING WATER LEVELS**

Low Water Levels: For over 50 years my family moored boats in a sheltered cove near my camp. This possibility has become increasingly limited since the cove is often completely devoid of water. The cove previously had a rocky bottom, but with the continuous seasonal drawdowns, it has become a field. I am including two photos of the cove to show the change in ecology over the past 20 years.



The cove where I moored my boat.



Looking back at the water, so far away

High Water Levels: Here are examples of the high water levels being exceeded. In the photo below, high water in spring deposited driftwood up over the riprap and then eroded the grass and soil underneath.



In the next photo, excessive water levels in winter caused ice to completely re-shape the shoreline, raising it 14”.



**NAVIGATIONAL ACCESS AND SAFETY**

Access between the lakes: When the water levels are excessively low, it creates navigational hazards and lack of access. There are years when it has become nearly impossible to navigate between the lakes.




The photo above shows the passageway between Chesuncook and Ripogenus. The passage is strewn with so many exposed ledges as to render it nearly impassable.



But even worse is the passageway between Chesuncook and Caribou. Circled in the photo above is a canoe that eventually needed to be hauled through the channel. *Photo from 2020.*

Navigational Safety: Within each individual lake we see ledges that were previously underwater but are now creating serious safety concerns for boaters and recreational users. As the water draws down, the ledges and rocks move continuously closer to the surface, and are being struck by recreational users, damaging their boats. I fear it is just a matter of time until someone is seriously injured. Public safety needs to be a priority. Rather than wait for tragedy to strike, we need to be proactive.

**RECREATIONAL AND FISHING ACCESS:**

Recreational Access: People come from all over the country to canoe down the upper West Branch into Chesuncook Lake. These travelers depend on State campsites that are located along the way, but the drawdowns limit access to these campsites. This year, the State could not safely reach the campsites by boat and eventually pulled their boat before the normal end of their season.

Fishing Access: Chesuncook is blessed with many major tributaries which are considered prime fishing in September. But the excessively low water levels greatly limits access to these traditional fishing holes by rendering access to them impassable during September. The photo below is of a well-known fishing spot along a tributary that was rendered inaccessible from Chesuncook during September.



**PERSONAL PERSPECTIVES**

Moorings: I mentioned previously about the drastic ecological changes in the cove where I moored my family moored boats for 50 years. I have included a photo of the three boat moorings I placed in the cove over that time period. Mooring #1 was used for years without difficulty. Then the water levels gradually dropped, so I added mooring #2. Those two moorings continued to suffice for many more years. More recently I added mooring #3. Now all of these moorings are out of water because the cove is dry. When this happens, I need to pull my boat. Once pulled, it is very difficult to relaunch for an outing because the “public landing” is nearly impassable.




Dock: It is a constant struggle to continuously relocate the dock as the water levels recede. The water level is down 20+ feet, and the drop off to the dock is so steep now, it is actually treacherous to attempt to utilize the dock.



It is a long way up a steep rocky slope.

Winter Shoreline damage: The shoreline damage caused from excessive high water impacted my camp property. The photo below depicts how the shoreline was pushed up by ice expansion during the winter - 14".



And the picture below shows the result of the changes to the shoreline - the damage to my brick fireplace - raised, cracked, with many loose bricks behind it. I removed this fireplace and replaced it.



In closing: To my knowledge, during the last relicensing no one represented the camp owners. We did not envision the impacts these water level fluctuations would have on the ecology, navigation, safety, fishing and recreation. We have each been affected in a personal way and surely our camp valuations and marketability are lowered. We need a littoral zone study. In addition, GLHA needs to release all requested water level and flow data since the previous relicense, not just a summary. **Regulation cannot happen without transparency.**

Sincerely,

Jeff Fayle
jfayle@gmail.com

# United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Maine-New Hampshire Fish and Wildlife Service Complex
Ecological Services
Maine Field Office
P.O. Box A
306 Hatchery Road
East Orland, Maine 04431
207/469-7300 Fax: 207/902-1588

ER 21/0320 October 7, 2021

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

**RE: Pre-Application Document Comments, Study Requests, and Scoping Document Comments for the Ripogenus (FERC No. 2572-133) and Penobscot Mills (FERC No. 2458-247) Hydroelectric Projects**

Dear Secretary Bose:

This responds to the Pre-Application Document (PAD) for the Ripogenus and Penobscot Mills Hydroelectric Projects (collectively referred to as Projects), located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot Counties, Maine. The PAD is being provided in preparation of an application for a new federal license for the Projects. The United States Fish and Wildlife Service (Service) offers the following comments based on the PAD (submitted to us by Great Lakes Hydro America, LLC [GLHA] on June 11, 2021) and information we obtained at the Federal Energy Regulatory Commission (Commission) virtual scoping meeting and site visit held on September 09, 2021.

*PRE-APPLICATION DOCUMENT*

**PROPOSAL**

Ripogenus

The Ripogenus project consists of a 795-foot-long, 83-foot-high concrete gravity dam, topped by two concrete ogee spillway sections totaling approximately 480 feet in length, which creates a 29,270-acre impoundment extending approximately 20.8 miles upstream with a normal full pond elevation of 941.59 feet United States Geological Survey (UGSS) datum. Ripogenus, Caribou, and Chesuncook Lakes as well as Black, Brandy, and Moose Pond are all part of the impoundment created by the Ripogenus dam. According to GLHA, the impoundment's usable

storage is about 688,705 acre-feet with a maximum drawdown of 44 feet, to an elevation of 897.59 feet.

Water flows from the Ripogenus impoundment through a concrete intake structure that consists of trashracks with 2-5/8 inch clear spacing, and there are three vertical Francis turbines at the project. The intake structure connects to 16-foot-diameter concrete-lined tunnel that is approximately 3,850 feet long and connects to three penstocks that lead to the powerhouse (i.e., McKay Station). Flows diverted to the tunnel, penstocks, and powerhouse bypass a 0.75-mile-long river reach, the Upper Gorge, of the West Branch. The 130-foot-long by 45-foot-wide powerhouse contains three vertical Francis-type turbines, each connected to a generator. Flow from the powerhouse is conveyed back to the West Branch via a 50-foot-long excavated bedrock tailrace.

The Ripogenus project contains one utility-scale battery energy storage site.

Penobscot Mills Project

The Penobscot Mills project consists of four hydropower developments and one storage development: North Twin, Millinocket, Dolby, East Millinocket, and Millinocket Lake Storage which is located on Millinocket Stream.

*North Twin Development*

The North Twin Development consists of a 1,051-foot-long concrete and earth-filled structure at the outlet of Elbow Lake. The dam includes a 114-foot-wide intake structure and powerhouse, a 34-foot-wide fishway for resident fish species, a 117-foot-long tainter gate section, and a 286-foot-long earthen embankment. In addition to the dam, there are six dikes, totaling 2,530 feet in length, upstream of the dam, which retain water. The North Twin impoundment includes Elbow, South Twin, North Twin, Pemadumcook, and Ambajejus Lake. The impoundment is approximately 11.8 miles long and has a surface area of approximately 17,790 acres at the normal full pond elevation of 491.92 feet. According to GLHA, the impoundment's usable storage is about 344,355 acre-feet with a drawdown of 22 feet.

Water flows from the North Twin impoundment through an intake structure to the powerhouse. The intake contains nine water passages, each 8 feet wide by 13 feet high and equipped with a steel gate to control the flow of water to the turbines. The intake is protected by trash racks with 2-5/8-inch clear bar spacing. Water exits the powerhouse through six tailrace bays and flows through a 104-foot-wide tailrace back into the West Branch. There are two vertical fixed blade turbines and one vertical Kaplan turbine at the project.

*Millinocket Development*

The Millinocket Development consists of a 1,262-foot-long concrete dam (referred to as Stone dam) located at the outlet of Quakish Lake which consists of a 300-foot-long overflow spillway section with no flashboards, a 358-foot-long spillway section with 30-inch-high flashboards, a 428-feet, five-inch-long spillway with a two-foot, nine-inch-high rubber, inflatable dam. The

dam itself directs water into a canal which is 150-feet-wide by 1,400-feet-long and leads to Ferguson Pond. The trashracks for the six 10-foot diameter penstocks have a clear spacing of 2-7/8 inches, while the trashracks for the single 11-foot diameter penstock have a clear spacing of 2-1/2 inches. There are eight horizontal Francis turbines at the project.

*Dolby Development*

The Dolby Development consists of a 1,395-foot-long concrete and earth-filled structure located at the outlet of Dolby Pond, a 27-foot-long concrete abutment, four spillway sections, a 76-foot-wide waste gate, a 209-foot-wide intake with an integral powerhouse, and two contiguous earthen dikes measuring 300 feet long and 250 feet long. Water is drawn from Dolby Pond through a 23-foot-wide by 209-foot-long concrete intake structure with nine openings. Each opening is equipped with a headgate to control the flow of water to the turbines. Eight sets of trashracks, having a total length of 174 feet, extend across the upstream side of the intake. The trashracks for bays 2 through 4 have a clear bar spacing of 1-5/8 inches, and the trashracks for bays 5 through 8 have a clear bar spacing of 2-5/8 inches. Water flows from the intake to a 115-foot-wide by 167-foot-long powerhouse that contains four operable turbine-generator units (Units 5, 6, 7, and 8). Units 1,2,3, and 4 are out-of-service according to GLHA and do not currently contribute to the development's rated capacity. Three of the operable turbines are inclined Kaplan units and one is a fixed blade unit.

*East Millinocket*

The East Millinocket Development is located approximately 1.7 miles upstream of the Medway project (FERC No. 2666) and consists of a 717.5-foot-long structure with two spillway sections measuring 366 feet, a 59-foot-wide waste gate structure. The impoundment extends from the dam 1.9 miles upstream to the tailwater of Dolby. The surface area of the impoundment is 128 acres at normal pull pond elevation of 287.2 feet. The intake contains 12 gate openings that lead to 6 covered flumes in which the turbines are located. Trashracks are located immediately upstream of the gate openings and have 1-1/4-inch clear spacing between the bars. The powerhouse contains six horizontal Francis turbines.

*Millinocket Lake Storage Development*

The Millinocket Lake Storage Development consists of a 635-foot-long concrete and earth-filled dam located at the outlet of Millinocket Lake. The dam includes a 19-foot-long spillway section and an adjacent 58-foot-long gated section that contains four lift gates and one log sluice gate. The normal full pond elevation of the lake is 480 feet with a surface area of approximately 8,640 acres. According to GLHA, usable storage is 45,370 acre-feet with a 6.2-foot drawdown. The development's pumping station, which contains two pumps, is located on the west side of Millinocket Lake, about 6.2 miles from Millinocket Lake Storage Dam. Water is conveyed from the pumping station through two 544-foot-long, 4-foot, 6-inch-diameter steel pipes, which is then discharged to Ambajejus Lake through an outlet structure. According to the PAD, the Millinocket Development contains seven operable (Units 1, 3, 4, 5, 6, 7, and 8) and one inoperable (Unit 2) horizontal Francis turbines. GLHA describes Unit 2 as out out-of-service, but it "routinely evaluates rehabilitation of the unit based on market conditions and other factors."

Protection, Mitigation, and Enhancement Measures

Outside of providing flows for increased angling opportunities, landlocked salmon habitat, and whitewater rafting as well as deployment of nesting platforms for loons and other aquatic birds, and operation and maintenance of an upstream fishway at the North Twin Development for resident species, GLHA has proposed no additional protection, mitigation, or enhancement (PME) measures at Ripogenus, North Twin, Millinocket, Dolby, East Millinocket, or Millinocket Lake Storage.

## COMMENTS

*PAD COMMENTS*

### 4.3 Existing Project Facilities

GLHA provided a detailed description for each of the six dams; however, several important pieces of information are missing and should be provided to the agencies:

- a thorough description of how project operations are monitored and recorded;
- the minimum hydraulic capacities, runner diameters and runner speeds of all turbines (those in operation and those currently deemed out-of-service) at each dam;
- the calculated approach velocity at the trashracks/intakes (based on the wetted trashrack area); and
- how the Applicant intends to operate each development for the duration of any new license issued.[1]

### 4.4 Project Operations

Currently, it is unclear how GLHA operates the Projects as operations data was not provided in the PAD and is not available to the public, as discussed at the September 9, 2020 scoping meeting.[2] On September 13, 2021, the Service asked the Commission to require the Applicant to provide stakeholders with ten years of operations data for each project.[3] In the Commission's September 28, 2021 response, this item was not addressed or discussed.[4] Operations data is needed in order to understand how each facility is operated and how operations might affect the

[1] As noted in the PAD, some project turbines are out-of-service. At least for Millinocket Lake Storage Development, the choice to keep the turbine offline is routinely evaluated and the turbine could be brought back online if market conditions, and other factors, make it profitable to do so. However, to properly assess the impacts each development may have on the Service's trust resources, clarity and confirmation about (1) how the Projects are operated; and (2) how the Applicant plans to operate the Projects for the duration of any new license term is needed.
[2] Volume 1 of the PAD presents monthly and annual flow duration curves which show outflows from the Ripogenus and Penobscot Mills Projects and are based on GLHA operations data from 2016 through 2020 for the McKay Station and North Twin Development.
[3] Accession No. 20210914-5124
[4] Accession No. 20210928-3057

hydrology in the West Branch and mainstem Penobscot River.[5] This data will also better inform the agencies understanding of study results collected as part of this licensing proceeding.

Therefore, the Service requests the Applicant provide water surface elevation and project discharge (along with other relevant operational data and hydrologic records) at each of the six dams. Ideally hydrologic records maintained by GLHA, and the previous licensee, from 1980 to 2021 would be provided to the agencies. Additionally, the Applicant should deploy water level loggers throughout the system as a means of collecting data on how water surface elevation changes hourly over the course of three years as requested in the *Impacts of Water Level Fluctuations on Riparian and Aquatic Vegetation, Including Invasive Species, Associated Wildlife, and their Associated Habitats* study provided herein.

**5.3 Water Resources**

River Flows

According to the PAD, the North Twin Development dam and the Ripogenus Project (McKay Station) operate in a peaking mode as part of the existing store-and-release license condition(s). While the Millinocket, Dolby, and East Millinocket Development dams are said to be run-of-river facilities in the PAD, they are operated in response to peaking inflows from the North Twin Project. Therefore, outflows of the run-of-river dams also fluctuate similarly to the peaking facilities.

In addition to understanding how the Projects currently operate, a tool (or model) is needed that will allow stakeholders to predict impacts of alternative project operations and any potential mitigation measures to protect or enhance aquatic fish and wildlife resources. Therefore, the Service is requesting a three-dimensional computational fluid dynamics study, provided herein. The CFD study will also allow the agencies to evaluate fish behavior and passage data collected as part of the requested upstream and downstream eel studies (see below) and could be used to help model, and plan for, potential drought and/or flood scenarios that might occur during the duration of any newly issued license due to climate change and other factors.

**5.4 Fish and Aquatic Resources**

Fisheries Management

Currently, there are no upstream or downstream American eel (*Anguilla rostrata*) passage and protection measures installed at the Ripogenus, North Twin, Millinocket, Dolby, East

[5] GLHA states, in Section 1.6 of the PAD, that the impoundments and project operations are used to modify flows in the mainstem Penobscot River. Specifically, "The Project storage impoundments are managed on an annual cycle to dampen the variability and occasional extremes of seasonal precipitation and runoff through storage within the impoundments. This storage allows for continuous flows to downstream aquatic habitat and spawning areas within the West Branch and the mainstem of the Penobscot River during times of lower inflows to the system. In addition, the storage allows flows from the West Branch to be reduced during higher seasonal flow periods when the combined flows from the East and West Branches have the potential to adversely impact human life, property, and environmental resources downstream along the mainstem Penobscot River."

Millinocket, or Millinocket Lake Storage dams. However, as indicated in the PAD, "American eel have been found in each of the Project impoundments."

To date, studies have not been performed to identify information relative to areas where eels concentrate below each dam, where permanent passage facilities would be best placed, nor has there been an assessment of the numbers and size of eels attempting to pass each facility. To fill these data gaps, the Service requests GLHA conduct a study that assesses areas of eel concentration so that permanent upstream passage facilities can be properly sited. Similarly, studies have not been performed to evaluate the route of passage and survival of adult silver phase eels at Ripogenus, North Twin, Millinocket, Dolby, East Millinocket, or Millinocket Lake Storage dams. However, trashrack spacing greater than ¾-inch is known to create a high risk of entrainment and mortality to both migratory and resident fish species (USFWS 2019). To fully understand how adult silver phase eels move past each dam, through the turbine intakes, over spill, and any other routes applicable to each dam, the Service recommends GLHA conduct a downstream eel passage assessment. Turbine injury and mortality studies are also needed and should be used in conjunction with results of the passage routing studies, where applicable, to calculate total through-project survival rates. As part of this assessment, GLHA should perform a downstream eel passage alternatives study, in coordination and via a collaborative process with, the Service (and the other agencies) in order to determine conceptual options, and expected performances for, improved downstream passage that will reduce delay, increase passage efficiency, and increase survival for downstream migrating adult eels in the West Branch. Additionally, data regarding the size range of eels moving past each dam, as well as their migration timing, is needed and should be combined with the other downstream eel studies to better understand survival estimates and to inform when downstream passage and protection measures need to be operated.

The Service herein provides study requests to address these information needs.

Freshwater Mussels

The PAD provides limited information on the distribution and abundance of freshwater mussels within the West Branch of the Penobscot River/within the vicinity of the Ripogenus and Penobscot Mills projects.[6] Given this, the Service is requesting that GLHA conduct a mussel survey (1) in each project impoundment and bypass reach; and (2) in project-affect reaches downstream from project dams and powerhouses (e.g., Upper Gorge, Holbrook Side Channel, what GLHA is referring to as the "Back Channel", Millinocket Stream, etc.) to determine the species composition, distributions, and abundance of freshwater mussels, including the State-listed brook floater (*Alasmidonta varicosa*), yellow lampmussel (*Lampsilis cariosa*), and tidewater mucket (*Leptodea ochracea*).[7]

Should any federally listed, or priority at-risk species, be found at the East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, or Ripogenus the Service reserves the right to request an

[6] A freshwater mussel survey was last performed in parts of the West Branch by IFW in 2009.
[7] The brook floater is also a priority at-risk species for the Service.

instream flow study to assess the impacts of the range of the proposed project discharges on the wetted areas, and optimal habitats, for said species.

**5.6 Wetland, Riparian, and Littoral Vegetation**

Appendix F of the PAD lists the plant species that existed at Ripogenus and Penobscot Mills in the early 1990's, information that was collected during the last relicensing. However, there is no information in the PAD pertaining to how botanical resources may have changed over time due to operation of the Projects. Further, while Table 5.5-5 and 5.5-6 provides a list of invasive plants found within the state of Maine, none are explicitly identified as occurring within the Ripogenus and Penobscot Mills project areas. Likewise, the lists of mammals, birds, amphibians, and reptiles are only those that may occur at each development associated with each of the six developments.

These information gaps need to be filled so that the resource agencies can assess any potential impacts related to operations of the Projects and to develop adequate protection measures to meet management goals and objectives. Plants and wildlife occurring in habitats in the project areas may benefit from PME measures, given the potential effects of current and future operations as well as any potential maintenance activities. Therefore, the Service herein submits a request for such a study as well as an assessment of the impacts of project-induced water level fluctuations on wetlands, littoral and riparian vegetation, and wildlife.

**5.7 Rare, Threated, and Endangered Wildlife Species**

Mist-netting surveys conducted in several locations in Piscataquis County in 2006 and 2008 found northern long-eared bat (NLEB), indicating that the species could be present within the Ripogenus and Penobscot Mills project boundaries. However, baseline information regarding the presence/absence and distribution of the NLEB within the Project's boundaries is lacking. These data are needed to meet the goal of evaluating project effects. An acoustic survey may also provide information regarding the presence of the little brown bat (*Myotis lucifugus*) and tri-colored bat (*Perimyotis subflavus*) within the project areas.[8] The Service herein provides a study request to address these information needs.

*RECOMMENDED STUDIES*

GLHA is not proposing to undertake any studies as part of this relicense proceeding. Enclosed please find our formal study requests (Attachment A) in the format required pursuant to 18 CFR §4.38(b)(5).

*SCOPING DOCUMENT 1*

**3.1.3 Project Operations**

While the Scoping Document and PAD indicate the Millinocket, Dolby, and East Millinocket Development dams are run-of-river facilities, these dams are operating in response to peaking

[8] Both species are currently undergoing consideration for listing by the Service under the Endangered Species Act.

inflows from the North Twin Development dam and Ripogenus (McKay Station). Therefore, the outflows of the Millinocket, Dolby, and East Millinocket Development likely fluctuates, like that of the peaking facilities upstream. Operations data is needed in order to understand if Millinocket, Dolby, and East Millinocket are truly operated in a run-of-river mode.

### 4.1.2 Water and Aquatic Resources

Effects of project facilities and operations on water and aquatic resources, including fish migration, and wildlife and botanical resources should be analyzed for each individual dam, as well as cumulatively (to include the mainstem Penobscot River). Additionally, effects of fish entrainment should not be limited to fish populations but should include impacts to food web interactions and overall ecosystem productivity.

Thank you for this opportunity to comment. Please direct any questions to Julianne Rosset at julianne_rosset@fws.gov.

Sincerely,

AMANDA CROSS

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Date: 2021.10.07 08:22:47 -04'00'

Amanda S. Cross, Ph.D.
Project Leader
Maine Field Office
Maine-New Hampshire
Fish and Wildlife Service Complex

Attachments

## LITERATURE CITED

USFWS (U.S. Fish and Wildlife Service). 2019. Fish Passage Engineering Design Criteria. USFWS, Northeast Region R5, Hadley, Massachusetts

cc: FERC, Secretary (e-filed)
PIN, Dan McCaw
NMFS, Dan Kircheis, Jeff Murphy
MEDEP, Christopher Sferra
MEDMR, Casey Clark
MEDIFW, John Perry
RO/Fisheries, Brian Sojkowski
TU, Steve Heinz
ES: JRosset:10-7-21:(603)309-4842

# ATTACHMENT A

## Study Requests

# Impacts of Water Level Fluctuations on Riparian and Aquatic Vegetation, Including Invasive Species, Associated Wildlife, and their Habitats in the Ripogenus and Penobscot Mills Impoundments

(Ripogenus, P-2572; and Penobscot Mills, P-2458)

***Goals and Objectives***

The goal of this study is to obtain baseline information on riparian, wetland, emergent and submerged aquatic vegetation, and associated shallow water aquatic habitats (subject to operational inundation and exposure to near exposure) known to occur in the project areas. Information would be used to determine whether riparian, wetland, emergent aquatic vegetation (EAV) and submerged aquatic vegetation (SAV), littoral, and shallow water (e.g., mid-river bars and shoals) habitats are impacted by current water level fluctuations permitted under East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, and the Ripogenus projects' licenses and whether these vegetation types and shallow water habitats can be protected and restored by modifications to project operations or other mitigation measures. This analysis needs to take into account existing and potential future limits on impoundment level fluctuations intended to limit recreation impacts, and the interactions of any changes in impoundment level fluctuation range or frequency and discharge changes under any new license issued for the projects. This information is needed to determine whether existing operations affect plants, habitat, and wildlife in the project areas, whether aquatic vegetation and its habitats can be enhanced by modifications to project operations, or other mitigative measures, and whether there is any unique or important shoreline or aquatic habitats that should be protected.

The specific objectives of the field study, at a minimum, include:

1. collect data on how water surface elevation changes hourly over the course of three years;
2. quantitatively describe and map wetland types within 250 feet of the shoreline, and describe associated wildlife;
3. delineate, quantitatively describe, and map all wetland types, including invasive species and wildlife observed (e.g., bald eagle nesting, waterfowl nesting, etc.) within 200 feet of the shoreline, and the extent of this habitat if it extends beyond 200 feet; and
4. quantitatively describe (e.g., substrate composition, vegetation type and abundance) and map shallow water aquatic habitat types subject to project operation inundation and exposure, noting and describing additional areas where water depths at the lowest operational range(s) are wetted to a depth less than one foot (flats, near shore areas, gravel bars, with very slight bathymetric change).

A second year of study may be required should river discharge in the first year prove to be atypical (outside of 25-75th percentile of average weekly flow values) during the study period.

The field study should produce a habitat inventory report that includes:

1. the results of the field study in the form of maps and descriptions;
2. an assessment of project effects on wetland, riparian, littoral zone vegetation and shallow water habitats, invasive plant species, and wildlife habitat at the project;
3. recommendations for any necessary plant, habitat type, or wildlife, protection and/or invasive species control measures; and
4. recommendations for plant, habitat type, or wildlife protection and/or invasive species control measures, including riparian buffer restoration and protection and protection of key nest and roost trees for bald eagles.

***Resource Management Goals***

The U.S. Fish and Wildlife Service (Service) seeks the accomplishment of a number of resource goals and objectives through the relicensing process for the projects. General goals include the following:

1. Ensure that protection, mitigation and enhancement measures are commensurate with project effects and help meet regional fish and wildlife objectives for the basin.
2. Conserve, protect, and enhance the habitats for fish, wildlife, and plants that continue to be affected by the projects.

Specific to aquatic resources, the Service's goals are:

1. Protect, enhance, or restore diverse high-quality aquatic and riparian habitats for plants, animals, food webs, and communities in the watershed and mitigate for loss or degradation of these habitats.
2. Minimize current and potential negative project operation effects on water quality and aquatic habitat.

***Public Interest***

The requester is a natural resource agency.

***Existing Information and the Need for Additional Information***

Existing information in the Pre-Application Document (PAD) does not quantify EAV and SAV in the project area associated with each development, nor does it quantify shallow aquatic habitat types and physical features (e.g., depths, substrates, wood structure), that are the associated environment for aquatic biota in the project area(s) associated with each development. The PAD does indicate that there is aquatic vegetation present at certain developments but does not provide monitoring data.

Further, the PAD indicates that several developments associated with the Penobscot Mills project (North Twin Development) and Ripogenus (McKay Station) operate in a peaking mode as part of their store-and-release license conditions. The Millinocket, Dolby, and East Millinocket

Developments, although being run-of-river facilities, presumably operate in response to peaking inflows from the North Twin Project; thus, outflows of these dams also fluctuate similarly to peaking facilities.

It is unclear what the actual timing, frequency and magnitude of operations are over the course of a year, at each development, and how that relates to aquatic plant species establishment, growth, survival, littoral zone or other shallow water habitats. It's also unclear how operations affect fish spawning periods like reproduction success and subsequent recruitment (e.g., bass and fall fish nests) in available and utilized habitat, and how the quantity and quality of these shallow water habitats are affected by project operational manipulation/alteration (as currently permitted or proposed).

The PAD provides a list of plant and wildlife species whose native ranges overlap with the project areas, but it does not provide any baseline information on known occurrences of these species in the wetlands, riparian, littoral, or shallow water habitats, within or adjacent to the project area. Plant and wildlife occurring in these habitats may benefit from protection, mitigation, and enhancement (PMEs) measures, given the potential effects of continuing the current peaking operating regime.

***Nexus to Project Operations and Effects***

Water level fluctuations due to project operations could affect EAV and SAV habitat as well as the quantity and quality of littoral and shallow water habitat. These operational water level fluctuation effects are expected to impact fish species use of these habitats and may affect spawning fishes, reproductive success, and subsequent population recruitment including but not limited to sea lamprey, fallfish, and bluegill, which spawn in mid-to-late spring through early summer in areas subject to daily or more frequent water level fluctuations.

The current operating mode as the agencies understand it, as well as the unknowns, may affect wetland riparian, littoral and other shallow water habitats, and promote the introduction and expansion of invasive plant species through fluctuating water levels. A study that explains the relationship between the proposed mode of operation and the type and quantity of wetland, riparian, littoral, shallow water habitats, and invasive species affected would help inform a decision on the need for protection and/or control of these resources in any new license.

Riparian buffers provide for riverbank stability, reduction in nutrient and sediment from runoff, shading and reduced solar heating of river waters and wildlife habitat (including eagle nesting and roosting habitat) and movement corridors. Management of the project's shorelines are within the scope of project review and a Shoreline Management Plan is likely to be required. Incorporation of riparian resource protection and enhancement into this plan will require baseline information on existing conditions

***Methodology Consistent with Accepted Practice***

The Applicant should deploy water level loggers throughout the West Branch of the Penobscot River as a means of collecting data on how water surface elevation changes hourly over the

course of two to three years. This data will better inform the information below, as well as data collected in other studies related to this relicensing.

The proposed study should utilize existing information (any existing maps portraying wetland types, detailed bathymetry data, etc.) in conjunction with field surveys designed to describe the characteristics of each mapped wetland, riparian, littoral and shallow water habitat, including plant species composition, relative abundance/density, habitat quality, and land use. Surveys should be conducted to describe these habitats at the lowest water level operational range permitted on a daily operation schedule, under low flow conditions. Information collected should include:

1. plant species composition, and their relative abundance/density and condition/structure (e.g., seedlings);
2. structured data, including estimates of average heights and aerial cover of each vegetation layer (specifically denoting invasive species);
3. aquatic habitat substrate composition, quantity (i.e., percent types and area), wood structure (relative abundance measure applied by area), water depths (inundated, exposed, and water less than one foot);
4. predominate land use(s) associated with each cover type;
5. wildlife sightings should be noted; and
6. field-verified wetland, riparian, and littoral and shallow water habitats and invasive species occurrences should be geo-referenced as polygons and overlain on orthophoto at a suitable scale.

***Level of Effort/Cost, and Why Alternative Studies Will Not Suffice***

A wetland, riparian, littoral/shallow water, invasive species inventory, coupled with the species studies component outlined above, of the scope envisioned would likely require six to eight months to complete and cost $40,000 to $50,000. No alternatives are proposed.

# Three-Dimensional Computational Fluid Dynamics (CFD) Modeling Upstream and Downstream of the Discharge and in the Vicinity of Powerhouse Forebays

(Ripogenus, P-2572 and Penobscot Mills, P-2458)

***Goals and Objectives***

The goal of this study is to determine the potential impacts of the East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, and the Ripogenus dams on: (1) the zone of passage for migratory fish near turbine discharge; and (2) natural flow regimes in the West Branch of the Penobscot River immediately upstream and downstream of each project.

Specific objectives of the study include:

1. Develop a CFD model of the full width of the West Branch upstream and downstream of each projects discharge.

2. Model flow characteristics upstream and downstream of the project under existing project operations and at several representative river flow levels, as well as any other modifications under consideration (including potential future impacts to operations as a result of climate change), to assess potential impacts to fish and wildlife resources.

3. Assess velocities and flow fields at, and in proximity to each project's intake/discharge structure when generating, and their potential to (1) interfere with fish migration; (2) create undesirable attraction flows; and (3) result in fish entrainment and/or impingement.

4. Assess the potential for velocity barriers to aquatic organism movement in the mainstem river resulting from generation flows at each project, alone and in combination with generation flows from the other projects on the West Branch.

5. Model, and then evaluate, flow characteristics under alternative project operations with potential measures to avoid, minimize, or mitigate impacts to fish and wildlife resources.

6. Define flow velocities, fields/magnitudes, and direction in front of each project's powerhouse.

This information is necessary to properly assess the scale, and feasibility, of potential upstream and downstream passage alternatives (see the *Downstream Passage Alternatives* study request). The requested information can be utilized to create a more productive, cost-effective, and

efficient alternatives analysis process by helping to narrow the focus to a minimal number of feasible alternatives.

***Resource Management Goals***

The mission of the U.S. Fish and Wildlife Service (Service) is to work with others to protect, conserve and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people. Service trust resources include wetlands, endangered species, and migratory species, all of which occur (or have the potential to occur) in the project area. Instream flow is an important riverine habitat characteristic that can have a large impact on aquatic habitat for fish, wildlife, and plants. Flow is an important directional guidance cue for instream navigation and attraction to upstream, and downstream, fishway entrances for migratory fish. As for downstream migration of adult eel, the results from the models will reveal flow magnitude and direction in front of each powerhouse.

These study requests are intended to facilitate the collection of information necessary to conduct effects analyses and to develop reasonable and prudent conservation measures, and protection, mitigation, and enhancement measures pursuant to the Fish and Wildlife Coordination Act, as amended (16 U.S.C. §661, *et seq*.), and the Federal Power Act (16 U.S.C. §791a, *et seq*.).

***Public Interest***

The requestor is a natural resource agency.

***Existing Information and the Need for Additional Information***

No project-specific information exists that will allow for a comprehensive assessment of existing project operations on West Branch flows and on fish and aquatic organisms in the project areas upstream and downstream of each dam. The Pre-Application Document does not contain any information, or tool(s), that will allow for predictions of impacts of alternative project operations, or potential mitigation measures to protect or enhance aquatic fish and wildlife resources. Further, a comprehensive understanding of fish behavior at each powerhouse forebay is needed to create safe, timely, and effective upstream and downstream passage for American eel on the West Branch. CFD models are a relatively cost-effective way to analyze existing and future conditions. As such, changes in the amount of attraction water, changes in which turbines are operating, and which spillway gates are releasing water can all be examined.

The Service notes, modeling this information now can help the resource agencies, as well as the Applicant, account for potential drought and/or flood related scenarios that might occur during the duration of any newly issued license, due to climate change and other factors.

***Nexus to Project Operations and Effects***

The Ripogenus and Penobscot Mills Projects have direct impacts to instream flows, aquatic habitats, and upstream and downstream migrating American eel in the West Branch of the Penobscot River. The development of the requested CFD models will aid in determining the potential impacts of the East Millinocket Development, Dolby Development, Millinocket

Development, North Twin Development, Millinocket Lake Storage Development, and Ripogenus dam. For downstream passage, the Service has velocity vector guidelines associated with intake racks and guidance screens; the output from these models will inform the resource agencies under what conditions appropriate velocities are being met and when they are being exceeded. Additionally, modeling of flow will aide in our interpretation of year one downstream passage telemetry results. Therefore, aspects of the CFD modeling effort could focus on the locations identified as important in the study results and GLHA could assess changes to structures of operations and evaluate them in the model. Suitable alternatives would then be tested in year three studies.

***Methodology Consistent with Accepted Practice***

A three-dimensional CFD model has become an increasingly common standard of analysis at hydroelectric projects across the nation. Within the northeast region, we have seen these types of models developed at the Holyoke (P-2004), Brunswick (P-2284), Shawmut (P-2322), Milford (P-2534) and Lowell (P-2790) projects. We would expect to engage with the licensee in terms of determining the appropriate areas and flows to be modeled. We expect the spatial extent of the model at each study site will vary. Given the large number of ways in which output from these models can be presented and the near infinite number of flows which could potentially be modeled, we would expect to consult with the applicant to reach agreed upon modeling efforts and scenarios to be examined.

***Level of Effort/Cost, and Why Alternative Studies Will Not Suffice***

The cost of developing, running, and testing a CFD model can vary tremendously; one large variable in determining the cost is based on the amount of existing bathymetric data to which GLHA currently has access. We roughly estimate the maximum cost of each CFD model to be $50,000, assuming no bathymetric data currently exists. Proactive communication with resource agencies will reduce the cost and iterative effort. Given the level of effort that has occurred at other projects where licensees have proposed to amend their license, we see the level of effort requested here as reasonable, given that GLHA is seeking a renewal of its license.

Regarding alternatives, no project-specific instream flow analysis tool has been developed for the West Branch that will allow for assessment of existing operations and alternative operational impacts on instream flow and aquatic habitat for fish and wildlife resources. Further, the model, once built, can be used to simulate flow conditions in the vicinity of each project during the migratory fish passage season and can be used together with behavior studies (i.e., telemetry studies and entrainment studies requested herein) to assess the impacts of varying project operations or potential mitigation operations and measures on fish migration and aquatic habitat. The Service knows of no other tool that will provide for these types of assessments. No alternatives are proposed.

# Upstream American Eel Passage Assessment
(Ripogenus, P-2572 and Penobscot Mills, P-2458)

The PAD identifies American eel as present in the Project area. Dams, such as East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, and the Ripogenus dam, are known to impair migration success for catadromous species such as American eel (ASMFC 2014). Presently, upstream passage facilities specific to the needs of migrating juvenile eels are not available at either project (or any of the dams that comprise the two projects). Installing upstream eel passage at each facility will address direct project related impacts and facilitate restoration of American eel within the Penobscot River watershed. The study request below is intended to provide data necessary to develop reasonable and prudent conservation measures, specifically safe, timely and effective passage for American eel.

If aspects of the project design or project operations changes with any new license, this study may need to be repeated.

***Goals and Objectives***

The goal of this study is to assess the locations for dedicated upstream passage for American eel.

The study has two objectives:

1. Conduct systematic surveys of eel presence/abundance below the East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, and the Ripogenus dam to identify areas of concentration of eels staging in pools or attempting to ascend wetted structures that would potentially establish the most effective location to place upstream eel passage facilities.
2. Collect eels with temporary trap/pass devices at areas identified from surveys as potential location of eel concentrations to assess whether eels can be collected/passed in substantial numbers, and whether locations are viable sites for permanent eel trap/pass structures.

***Resource Management Goals***

The Atlantic States Marine Fisheries Commission (ASMFC) has developed three documents related to the management of American eel and hydropower facilities:

1. Interstate Fishery Management Plan for American Eel. April 2000. Atlantic States Marine Fisheries Commission.
2. Addendum II to the Fishery Management Plan for American Eel. Atlantic States Marine Fisheries Commission. Approved October 23, 2008. 8 pp.
3. Addendum III to the Fishery Management Plan for American Eel. Atlantic States Marine Fisheries Commission. Approved August 2014. 19 pp.

Objectives of the management plan include: (1) protect and enhance American eel abundance in all watersheds where eel now occur; and (2) where practical, restore American eel to those waters where they had historical abundance, but may now be absent, by providing access to inland waters for glass eel, elvers, and yellow eel, and adequate escapement to the ocean for pre-spawning adult eel.

Addendum II contains specific recommendations for improving upstream and downstream passage of American eel, including requesting that member states and jurisdictions seek special consideration for American eel in the Commission's relicensing process.

Based on these plans, the U.S. Fish and Wildlife Service (Service) seeks the accomplishment of a number of resource goals and objectives through the relicensing process for the project. General goals include the following:

1. Ensure that protection, mitigation and enhancement measures are commensurate with project effects and help meet regional fish and wildlife objectives for the basin.
2. Conserve, protect, and enhance the habitats for fish, wildlife, and plants that continue to be affected by the project.

Specific to upstream passage of American eel, the Service's goals are:

1. Minimize current and potential negative project operational effects that could hinder management goals and objectives.
2. Minimize project-related sources of upstream passage delay, injury, and stress in order to facilitate access to historical rearing habitat.

Our study requests are intended to facilitate the collection of information necessary to conduct effects analyses and to develop reasonable and prudent conservation measures, and protection, mitigation, and enhancement measures pursuant to the Endangered Species Act of 1973, as amended (16 U.S.C. §1531 *et seq*.), the Fish and Wildlife Coordination Act, as amended (16 U.S.C. §661 *et seq*.), and the Federal Power Act (16 U.S.C. §791a, *et seq*.).

***Public Interest***

The requester is a natural resource agency.

***Existing Information and the Need for Additional Information***

The PAD does not provide information relative to areas eels concentrate below the East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, or Ripogenus dams or an assessment of the numbers and size of eels attempting to ascend each facility. Data from this study will provide information in support of the licensing process and in developing the administrative record for potential mitigation measures under Section 18 and/or Section 10(j) of the Federal Power Act.

***Nexus to Project Operations and Effects***

Dams impede the safe, timely, and effective passage of eels. The ability of eels to pass a dam depends on factors such as its height, hydraulics, presence of climbable surfaces (e.g., rough surface, wetted substrate), presence of predators, and risk of exposure to heat or drying while climbing a dam among others (Solomon and Beach 2004). Passage is also limited by the size of eel present. Only small juvenile eels are able to scale vertical surfaces (Machut et al. 2007). The design of the East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, and the Ripogenus dam creates multiple potential sites for upstream migrating eels to congregate. Site-specific data are necessary to understand project effects and support the decision process for properly designing and siting eel passage facilities.

***Methodology Consistent with Accepted Practice***

This study request consists of two parts: (a) an initial survey for presence and identification of areas where juvenile eels congregate and (b) a site evaluation for permanent eel passage. The methodologies described here are consistent with commonly accepted practices.

1. Objective 1: Systematic Surveys

   Surveys of eel presence and relative abundance should be conducted at regular intervals (as described below) throughout the eel upstream migratory season (approximately April 1 to November 30). Surveys should consist of visual inspection and trapping in likely areas where eels may concentrate. Areas of quiescent water and leakage points along the downstream face of the dams should be targeted. Methods should include visual surveys (on foot, from a boat, or snorkeling) and trapping using small mesh (< 1/8" clear opening) baited eel pots. Visual surveys should be performed once per week, at night, preferentially during precipitation events. Trap sets should be performed once per week, with an overnight soak time. Recorded data should include location, observation of eels (presence, absence, relative numbers, relative sizes, behaviors, time/date of observation), and survey method.

2. Objective 2: Trap/Pass Collections

   Areas identified from the systematic surveys as having significant number of eels present should be targeted as potential areas for permanent eel trap/passes and should be initially

assessed using temporary/portable trap passes. Temporary trap/passes should be purpose-designed and built for each location and operated throughout the eel upstream migratory season in the year following the survey. Ramp-type traps with supplementary attraction flow are preferred temporary trap/pass designs (Solomon and Beach 2004). Traps should operate daily, with catches quantified every 2-3 days. Data recorded should include location, trapping interval, absolute numbers of eels trapped, relative eel sizes, and hydraulic and environmental conditions during the trapping period.

All collected eels from surveys should be released at their point of capture; those eels collected from trap/pass collections should be transported to and released above each respective dam.

### *Level of Effort/Cost, and Why Alternative Studies Will Not Suffice*

The level of cost and effort for the survey component of the study would be low; a minimal number of personnel may be able to conduct the weekly surveys. The trap/pass component would require low to moderate cost and effort. We estimate the cost will be approximately $50,000 for the study. No alternatives are proposed.

## REFERENCES

ASMFC. 2014. Addendum IV to the Interstate Fishery management Plan for American Eel.

Machut, L.S., Limburg, K.E., Schmidt, R.E., and Dittman, D. 2007. Anthropogenic impacts on American eel demographics in Hudson River tributaries, New York. Transactions of the American Fisheries Society 136: 1699-1713.

Solomon, D.J., and Beach, M.H. 2004. Manual for provision of upstream migration facilities for Eels aned Elver. Environment Agency, Bristol, UK.

# Downstream American Eel Passage Assessment
(Ripogenus, P-2572 and Penobscot Mills, P-2458)

***Goals and Objectives***

The goal of this study is to determine the impact of the East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, and the Ripogenus hydroelectric projects on the outmigration of silver eels in the West Branch of the Penobscot River. Project operations can result in delay, mortality or injury during emigration. It is important to understand the passage routes at the project and the potential for delay, injury, and mortality to determine measures and recommendations to increase survival and improve fish passage at the projects.

The objectives of this study are:

1. Quantify the movement rates, including delays, and relative proportion of eels passing via various routes at the project (i.e., through the turbines, through the downstream bypass, via spill at the dams, etc.).
2. Quantify the relative proportion of eels passing each potential emigration route (spill, bypass pipes, powerhouse) at the project during various project operations.
3. Evaluate instantaneous and latent mortality and injury of eels passed via each potential route.

***Resource Management Goals***

The Atlantic States Marine Fisheries Commission (ASMFC) has developed three documents related to the management of American eel and hydropower facilities:

4. Interstate Fishery Management Plan for American Eel. April 2000. Atlantic States Marine Fisheries Commission.
5. Addendum II to the Fishery Management Plan for American Eel. Atlantic States Marine Fisheries Commission. Approved October 23, 2008. 8 pp.
6. Addendum III to the Fishery Management Plan for American Eel. Atlantic States Marine Fisheries Commission. Approved August 2014. 19 pp.

Objectives of the management plan include: (1) protect and enhance American eel abundance in all watersheds where eel now occur; and (2) where practical, restore American eel to those waters where they had historical abundance, but may now be absent, by providing access to inland waters for glass eel, elvers, and yellow eel, and adequate escapement to the ocean for pre-spawning adult eel.

Addendum II contains specific recommendations for improving upstream and downstream passage of American eel, including requesting that member states and jurisdictions seek special consideration for American eel in the Commission's relicensing process.

The U.S. Fish and Wildlife Service (Service) seeks the accomplishment of a number of resource goals and objectives through the relicensing process for the project. General goals include the following:

1. Ensure that protection, mitigation and enhancement measures are commensurate with project effects and help meet regional fish and wildlife objectives for the basin.
2. Conserve, protect, and enhance the habitats for fish, wildlife, and plants that continue to be affected by the project.

Specific to downstream passage of American eel, the Service's goals are:

1. Minimize current and potential negative project operation effects that could hinder management goals and objectives.
2. Minimize project-related sources of downstream passage delay, injury, stress, and mortality in order to maximize the number of silver eels migrating to the spawning grounds.

These study requests are intended to facilitate the collection of information necessary to conduct effects analyses and to develop reasonable and prudent conservation measures, and protection, mitigation, and enhancement measures pursuant to the Fish and Wildlife Coordination Act, as amended (16 U.S.C. §661, *et seq*.), and the Federal Power Act (16 U.S.C. §791a, *et seq*.).

***Public Interest***

The requester is a natural resource agency.

***Existing Information and the Need for Additional Information***

The Pre-Application Document does not contain information on the route of passage or the amount of delay that occurs for emigrating adult eels.

To date, no directed studies of eel entrainment or mortality have been conducted at the projects. These information gaps need to be filled so the natural resource agencies can assess the relative and cumulative impacts of project operations on outmigrating eels and develop adequate passage and protection measures to meet management goals and objectives.

***Nexus to Project Operations and Effects***

The East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, and the Ripogenus hydroelectric projects do not have entrainment prevention measures in place at their respective turbine intakes, nor are there designated spillway passage routes or fish bypass systems. To determine overall project survival, we need to understand the routes of emigration, the potential for delay under different river flow conditions and project operations, and the level of injury and/or mortality resulting from each potential passage route (i.e., the turbines, the spillway, etc). This study will contribute

information in support of the licensing process, and development the administrative record in support of potential mitigation measures under Section 18 and/or 10(j) of the Federal Power Act.

***Methodology Consistent with Accepted Practice***

In order to understand the movements of outmigrating silver eels as they relate to operations at Ripogenus and Penobscot Mills, radio telemetry technology should be utilized. Radio- and PIT-tagging is an accepted technology which has been used for a number of studies associated with hydropower projects, including at projects in the mainstem Penobscot River and the Merrimack River.

Studies should be designed to investigate the size class among the full spectrum of silver eels at each project, route selection (i.e., entrainment vs. spill) independently from estimation of mortality/injury, because these metrics require different methodologies. Studies will also likely benefit from data collected over two study years to account for differences in environmental conditions and natural variation in eel migration (especially route selection studies, which may be more significantly affected by environmental conditions during a given season than mortality/injury studies). It is also envisioned that results from route selection studies can guide design of turbine mortality studies. Therefore, it is proposed, at a minimum, route selection studies be conducted in multiple years, but mortality/injury studies may be conducted after the first year of route selection studies have been completed.

**Objective 1: Route Selection**

This study will involve systematic releases of radio- and PIT-tagged silver phase eels at strategic points above areas of interest, to assess general routes of passage (i.e., via spill, bypass, or turbines). Active downstream migrants should be collected within-basin if possible, but fish sourced from out-of-basin may be acceptable to meet sample size demands. Experimental fish must meet morphometric (e.g., eye diameter relative to body size) criteria to ensure they are migrant silver phase. Collections should be made within the migratory season, and eels should be tagged and released within 21 days after capture, but preferably within 7 days (particularly if the test eels are from out-of-basin).

All telemetered eels will be radio- and PIT-tagged. PIT antennas will be installed and monitored continuously to verify passage of eels via bypass channels.

A minimum number of 150 telemetered eels (e.g., five separate groups of approximately 30 eels each) per development will be required to maximize the data return. If enough eels cannot be captured for this study in a single year, the study will need to take place over the course of two years. Tagged eels should be released at an appropriate distance upstream of each dam. Groups of eels should be released during spill (if any) and non-spill and during periods of low, moderate, and high generation conditions. Since fish can drift a considerable distance downstream after they have died (Havn et al. 2017), a minimum of 25 dead eels should also be released as a control group in this study (at each project). Additionally, a control is needed to allow comparisons of movement rate and

success of passed and non-passed eels in reaching the detection point downstream. Therefore, an additional 50 telemetered (uninjured) eels should be released below each project and tracked as they emigrate.

Telemetry receivers and antennas should be located upstream and downstream of the spillway, at turbine intakes, station tailraces, etc. These locations will permit assessment of passage via the following potential routes: spillway; station turbines; any existing upstream fishway attraction water intake, etc. The final placement of receivers and antennas should be developed in consultation with the Service and the other agencies.

Mobile tracking (i.e., via boat) in the river between release sites and tens of kilometers downstream will be performed at regular intervals during and after releases to confirm routes and fates of passed fish or lost fish.

Movement rates (time between release and detection at radio antenna locations, and between radio antenna locations) of eels passing the projects by various routes will also be quantified.

The route selection portion of this study should occur in both study years.

**Objective 2: Spill, Bypass, and Turbine Mortality/Injury Studies**

Spill, bypass, and turbine mortality will be assessed using a balloon-tag method.

For spill mortality sites (dam spillways and downstream bypasses), tagged eels will be injected or released into spill flow at points where water velocity exceeds 10 ft/sec to minimize the possibility of eels swimming upstream into the headpond or canal. Passed balloon-tagged eels will be recovered below areas of spill and held for 96 hours in isolated tanks for observation of injury and latent mortality; unrecovered balloon-tagged eels will be censored from the data. Passed eels should be x-rayed for any potential injuries per Muller et al. 2020.

For turbine mortality sites, tagged eels will be injected into intakes of all units associated with the projects, operating at a full range of settings where intake water velocity exceeds 10 ft/sec to minimize the possibility of eels swimming back upstream through the intakes. Passed balloon-tagged eels will be recovered in the tailrace(s) and held for 48 hours in isolated tanks for observation of injury and latent mortality; unrecovered balloon-tagged eels will be censored from the data.

If the balloon-tag mortality component of the study occurs in study year one, all possible route selection sites would need to be evaluated. If the balloon-tag mortality component of the study occurs in study year two, results from the route selection study could be used to inform which sites need to be evaluated for mortality. Eels recovered from balloon-tag studies should not be used for route selection studies.

Data analyses of route selection and mortality (instantaneous and latent) will follow standard methodology.

Project operation (flows, levels, gate openings, number of units operating and operation level) and environmental conditions (river flow, temperature, turbidity, air temperature, precipitation) will be monitored regularly (hourly measurements if possible) throughout the duration of the studies and assessed for potential relationships to passage route selection, migratory delay, and/or passage survival.

These methodologies are consistent with accepted practice.

***Level of Effort/Cost, and Why Alternative Studies Will Not Suffice***

The level of cost and effort for the downstream eel passage study will be moderate to high; silver eels would need to be collected, tagged, and released in several locations over the course of the migration season. Data would need to be retrieved periodically, then analyzed. A multi-site route selection study conducted by the USGS Conte Lab on the Shetucket River in Connecticut cost approximately $75,000 for the first year of study. Costs are estimated at $100,000 per year for the route selection study and $50,000 to $75,000 for the spill, bypass, canal, and turbine mortality/injury study. No alternatives are proposed.

**REFERENCES**

Havn, T. B., F. Økland, M.A. Teichert, L. Heermann, J. Borcherding, S.A. Sæther, O.H. Tambets and E.B. Thorstad. 2017. Movements of dead fish in rivers. Animal Biotelemetry, 5: 7.

Mueller M, K Sternecker, S Milz, J. Geist. 2020. Assessing turbine passage effects on internal fish injury and delayed mortality using X-ray imaging. PeerJ 8:e9977 DOI 10.7717/peerj.9977

# Downstream Passage Alternatives Study
(Ripogenus, P-2572; and Penobscot Mills, P-2458)

***Goals and Objectives***

The goal of this study is to determine conceptual options, and expected performances for, improved downstream passage that will reduce delay, increase passage efficiency, and increase survival for downstream migrating adult eels as they attempt to pass the East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, and Ripogenus dam.

***Resource Management Goals***

The Atlantic States Marine Fisheries Commission (ASMFC) has developed three documents related to the management of American eel and hydropower facilities:

7. Interstate Fishery Management Plan for American Eel. April 2000. Atlantic States Marine Fisheries Commission.
8. Addendum II to the Fishery Management Plan for American Eel. Atlantic States Marine Fisheries Commission. Approved October 23, 2008. 8 pp.
9. Addendum III to the Fishery Management Plan for American Eel. Atlantic States Marine Fisheries Commission. Approved August 2014. 19 pp.

Objectives of the management plan include: (1) protect and enhance American eel abundance in all watersheds where eel now occur; and (2) where practical, restore American eel to those waters where they had historical abundance, but may now be absent, by providing access to inland waters for glass eel, elvers, and yellow eel, and adequate escapement to the ocean for pre-spawning adult eel.

Addendum II contains specific recommendations for improving upstream and downstream passage of American eel, including requesting that member states and jurisdictions seek special consideration for American eel in the Commission's relicensing process.

The U.S. Fish and Wildlife Service (Service) seeks the accomplishment of a number of resource goals and objectives through the relicensing process for the project. General goals include the following:

3. Ensure that protection, mitigation and enhancement measures are commensurate with project effects and help meet regional fish and wildlife objectives for the basin.
4. Conserve, protect, and enhance the habitats for fish, wildlife, and plants that continue to be affected by the project.

Specific to downstream passage of American eel, the Service's goals are:

3. Minimize current and potential negative project operation effects that could hinder management goals and objectives.
4. Minimize project-related sources of downstream passage delay, injury, stress, and mortality in order to maximize the number of silver eels migrating to the spawning grounds.

These study requests are intended to facilitate the collection of information necessary to conduct effects analyses and to develop reasonable and prudent conservation measures, and protection, mitigation, and enhancement measures pursuant to the Fish and Wildlife Coordination Act, as amended (16 U.S.C. §661, *et seq*.), and the Federal Power Act (16 U.S.C. §791a, *et seq*.).

***Public Interest***

The requester is a natural resource agency.

***Existing Information and the Need for Additional Information***

As indicated in the Pre-Application Document (PAD), eels occur upstream and downstream of the Ripogenus and Penobscot Mills projects. The American eel is a native migratory fish species of the Penobscot River watershed with a catadromous life cycle. Eels are widely recognized as a species of high ecological value and significance in its native habitats and has a significant commercial value in certain markets. In addition, eels were important historically to the Penobscot Indian Nation and other tribes for spiritual sustenance as well as physical subsistence.

In the PAD GLHA states that downstream passage is not provided at the East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, or Ripogenus dam. Therefore, the current configuration at each facility is not designed to today's fish passage design criteria and is likely insufficient to adequately pass American eel as they attempt to migrate downstream past each project. An alternatives analysis of the existing configuration at each dam and the subsequent impact(s) on adult eels is needed to evaluate each existing project as well as potential future project design and operation(s).

***Nexus to Project Operations and Effects***

Hydropower project related mortality and delay has a direct effect on migratory fish populations. East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, and Ripogenus dam all lack guidance structures to keep fish out of project turbines. Therefore, eels in the West Branch are likely not realizing their full juvenile production and adult escapement potential. Data derived from this study will facilitate evaluation of various fish passage alternatives, inform the Federal Energy Regulatory Commission’s (Commission) licensing process, and contribute to the development of an administrative record in support of protection and enhancement opportunities related to American eel.

***Methodology Consistent with Accepted Practice***

Fish Passage Engineering Alternative studies are a common way to explore various options in the decision-making process and have been used by the Commission in several licensing proceedings.

This study will require a review of existing downstream fish passage technologies that meet Service fish passage criteria (USFWS 2019 or the most recent version, as they become available) and should consist of conceptual engineering designs of downstream fish passage options that include physical screening of fish, adequate flows for attraction, and adequate relative velocities directing fish to downstream passage structures. Expected performance of each alternative should also be included in any report developed for this study.

The alternatives GLHA proposes to study for each project, the depth and breadth of the conceptual design, and the itemization and source of costs (as well as any potential lost generation modeling) should be agreed upon by the Service, and the other agencies, prior to GLHA conducting the study.

***Level of Effort/Cost, and Why Alternative Studies Will Not Suffice***

The level of cost and effort for this study would be low to moderate; we estimate the cost will be approximately $30,000. No alternatives are proposed.

**REFERENCES**

USFWS (U.S. Fish and Wildlife Service). 2019. Fish Passage Engineering Design Criteria. USFWS, Northeast Region R5, Hadley, Massachusetts.

# Evaluation of the Size of American Eels and the Timing of their Downstream Migratory Movements

(Ripogenus, P-2572; and Penobscot Mills, P-2458)

***Goals and Objectives***

The goal of this study is to understand the size range of eels moving past the projects as well as the migration timing of adult, silver-phase American eels in relationship to environmental factors and operations of hydropower projects on West Branch of the Penobscot River.

The objective of this study is to quantify and characterize (1) the full spectrum of silver eel sizes at each project; and (2) the general migratory timing and presence of adult, silver-phase American eels in the West Branch relative to environmental factors and operations of the East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, and Ripogenus hydroelectric projects.

***Resource Management Goals***

The Atlantic States Marine Fisheries Commission (ASMFC) has developed three documents related to the management of American eel and hydropower facilities:

10. Interstate Fishery Management Plan for American Eel. April 2000. Atlantic States Marine Fisheries Commission.
11. Addendum II to the Fishery Management Plan for American Eel. Atlantic States Marine Fisheries Commission. Approved October 23, 2008. 8 pp.
12. Addendum III to the Fishery Management Plan for American Eel. Atlantic States Marine Fisheries Commission. Approved August 2014. 19 pp.

Objectives of the management plan include: (1) protect and enhance American eel abundance in all watersheds where eel now occur; and (2) where practical, restore American eel to those waters where they had historical abundance, but may now be absent, by providing access to inland waters for glass eel, elvers, and yellow eel, and adequate escapement to the ocean for pre-spawning adult eel.

Addendum II contains specific recommendations for improving upstream and downstream passage of American eel, including requesting that member states and jurisdictions seek special consideration for American eel in the Commission's relicensing process.

The U.S. Fish and Wildlife Service (Service) seeks the accomplishment of a number of resource goals and objectives through the relicensing process for the project. General goals include the following:

5. Ensure that protection, mitigation and enhancement measures are commensurate with project effects and help meet regional fish and wildlife objectives for the basin.
6. Conserve, protect, and enhance the habitats for fish, wildlife, and plants that continue to be affected by the project.

Specific to downstream passage of American eel, the Service's goals are:

5. Minimize current and potential negative project operation effects that could hinder management goals and objectives.
6. Minimize project-related sources of downstream passage delay, injury, stress, and mortality in order to maximize the number of silver eels migrating to the spawning grounds.

These study requests are intended to facilitate the collection of information necessary to conduct effects analyses and to develop reasonable and prudent conservation measures, and protection, mitigation, and enhancement measures pursuant to the Fish and Wildlife Coordination Act, as amended (16 U.S.C. §661, *et seq*.), and the Federal Power Act (16 U.S.C. §791a, *et seq*.).

***Public Interest***

The requester is a natural resource agency.

***Existing Information and the Need for Additional Information***

The Pre-Application Document does not contain any information about (1) the size range of American eels in the West Branch of the Penobscot River; or (2) timing of downstream migratory movements and rates of eels in the West Branch. This information gap needs to be filled, as it relates directly to (1) more fully understanding survival estimates which will be provided via the requested *Downstream American Eel Passage Assessment*; and (2) when downstream passage and protection measures need to be operated.

***Nexus to Project Operations and Effects***

The timing of downstream migration of adult eels is not defined for the West Branch of the Penobscot River and there is not information about the size of the eels attempting to move downstream past the six projects that comprise Ripogenus and Penobscot Mills. Therefore, the general effects of hydroelectric project operations on eel survival to the ocean are unknown. Although separate study requests have been submitted to address project-specific downstream passage route selection, delays, and mortality of eels, general characteristics (size) of eels moving downstream and of river flow and environmental conditions may have significant relationships with project operation and eel migratory success and survival. For example, eels may tend to move immediately before or during periods of significant precipitation (or consequently river flow), times at which projects may be generating at maximum capacity or spilling, which may, or may not, present a higher passage risk to eels. Conversely, periods of low flow may be associated with a significant proportion of total river flow passing through turbine units, which present additional, or different, passage risk to eels. If discrete conditions which

promote eel downstream migration are known, it may be possible to take actions with respect to project operations which reduce or minimize passage risk (i.e., operation of a bypass, reduction of intake approach velocities, directed spillage through a particular route at a project, etc). These studies should provide baseline information on river-specific downstream migration to predict when silver-phase eels are expected to migrate downstream in the West Branch, from which project operations could be modified to minimize passage risks.

***Methodology Consistent with Accepted Practice***

Quantification of downstream movements of American eels in river systems requires systematic sampling of migrants throughout the migratory season. This can be accomplished with traditional active trapping methods (i.e., fyke or stow net sampling, weirs, or eel racks). Passive monitoring of migrant eels using hydroacoustic methods offers an alternative to active trapping. However, this form of passive monitoring requires verification of potential acoustic targets with some level of active (collection) or visual (traditional optical or acoustic video) sampling.

The Applicant will need to identify at least two potential locations that offer opportunities to conduct simultaneous passive and active sampling. Each location will need to possess a route of downstream passage which conducts a significant proportion of river flow and each would need a proximal bypass equipped with a sampler so that fish can be concentrated/collected from the passage route and identified to species. Project operations will influence the relative proportion of flow (and thus numbers of downstream migrant eels) in each passage route, so numbers of eels sampled in each route represent only a proportion of the total number of eels migrating downstream within the entire river. Since the absolute proportion of eels using a specific route at any one time is unknown, numbers of eels quantified within a route must serve as a relative index of the degree of migratory movement.

This study should quantify eel movements for two consecutive years since environmental conditions strongly influence migratory timing of eels, which can vary significantly from year to year (Haro 2003). Eels should also be measured during both study seasons, throughout the downstream passage season.

Eels will be quantified using methods similar to Haro et al. (1999), by continuously monitoring a fixed location at the projects with hydroacoustics. Since eels tend to concentrate in areas of dominant flow (Brown et al. 2009; EPRl 2001), the zone to be monitored should pass a dominant proportion of project flow throughout most periods of operation (i.e., forebay intake areas). Hydroacoustic monitoring shall encompass the entire potential migratory season, beginning in mid-August and ending in mid- December, and shall operate 24 hours per day. Data will be recorded for later processing and archiving.

Systematic active quantification of eels at downstream bypass samplers shall be performed simultaneously with passive hydroacoustic monitoring, to verify presence of eels and relative abundance of eel-sized hydroacoustic targets from the hydroacoustic data as well as the sizes of the eels collected.[9] Although daily operation of the bypass sampler could be performed, a more

[9] If all eels are not sampled, and a subset are measured for morphometrics, a power analysis will need to be performed that determines the most suitable sample size for this effort.

comprehensive technique is to monitor eels entering the bypass with an acoustic camera (i.e., DIDSON, BlueView, etc.). The acoustic camera will afford positive visual identification of eels as they enter the bypass, which is a concentration point for migrating eels. Acoustic camera monitoring will also allow monitoring to be performed 24 hours a day, and will be relatively unaffected by water turbidity
(which influences effectiveness of traditional optical video monitoring). The acoustic camera system will be operated during the same time period as acoustic monitoring, and images will be recorded for later processing and archiving.

Data analyses of size of eels, hydroacoustic, acoustic camera, bypass sampling, and environmental/ operational data will follow standard methodology.

Each project's operations (flows, levels, gate openings, number of units operating and operation level) and environmental conditions (river flow, temperature, turbidity, air temperature, precipitation) will be monitored regularly (hourly measurements if possible) throughout the duration of the studies.

***Level of Effort/Cost, and Why Alternative Studies Will Not Suffice***

The level of cost and effort for the downstream migrant eel migratory timing study would be moderate, given the level of cost for instrumentation, deployment, and data review/analysis. Cost is estimated at $50,000 per year for the study. No alternatives are proposed.

**REFERENCES**

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EPRI (Electric Power Research Institute). 2001. Review and documentation of research and technologies on passage and protection of downstream migrating catadromous eels at hydroelectric facilities. EPRJ Technical Report No. 1000730, Palo Alto, California 270 pp.

Haro, A. 2003. Downstream migration of silver-phase anguillid eels. Pages 215-222 in: Aida, K., K. Tsukamoto, and K. Yamauchi, eds. Eel Biology. Springer, Tokyo.

Haro, A., D. Degan, J. Horne, B. Kulik and J. Boubee. 1999. An investigation of the feasibility of employing hydroacoustic monitoring as a means to detect the presence and movement of large, adult eels (Genus Anguilla). S. 0. Conte Anadromous Fish Research Center Internal Report No. 99-01. Turners Falls, Massachusetts. 36 pp.

# Freshwater Mussel Survey
(Ripogenus, P-2572; and Penobscot Mills, P-2458)

***Goals and Objectives***

The goal of this study is to determine which freshwater mussels inhabit project-affected areas. A freshwater mussel survey was last performed in parts of the West Branch by Maine Inland Fish and Wildlife (IFW) in 2009.

The objective of the study will be to characterize the distribution and abundance of freshwater mussels in the impoundment, the bypass reach, and riverine reach downstream of the tailrace affected by project operations (including, but not limited to, Upper Gorge, Holbrook Side Channel, Back Channel, Millinocket Stream, etc.).

Should any federally listed, or priority at-risk species, be found at the East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, or Ripogenus dam the Service reserves the right to request an Instream Flow Incremental Methodology study to assess the impacts of the range of the proposed project discharges on the wetted area (and optimal habitat) for these species.

***Resource Management Goals***

The Service seeks the accomplishment of a number of resource goals and objectives through the licensing process for the Project. General goals include the following:

1. ensure that protection, mitigation and enhancement measures are commensurate with project effects and help meet regional fish and wildlife objectives for the basin; and
2. conserve, protect, and enhance the habitats for fish, wildlife, and plants that would be affected by the Project.

Specific to aquatic resources, the Service's goals are:

1. protect, enhance, or restore diverse high-quality aquatic and riparian habitats for plants, animals, food webs, and communities in the watershed and mitigate for loss or degradation of these habitats;
2. provide an instream flow regime that meets the life history requirements of resident fish and wildlife (including invertebrates such as freshwater mussels) throughout the project area; and
3. minimize potential negative effects of project construction, operation and/or maintenance activities on freshwater mussels that may inhabit the project area.

Our study requests are intended to facilitate the collection of information necessary to conduct effects analyses and to develop reasonable and prudent conservation measures, and protection, mitigation, and enhancement measures pursuant to the Endangered Species Act of 1973, as

amended (16 U.S.C. §1531 *et seq*.), the Fish and Wildlife Coordination Act, as amended (16 U.S.C. §661 *et seq*.), and the Federal Power Act (16 U.S.C. §791a, *et seq*.).

***Public Interest***

The requester is a natural resource agency.

***Existing Information and the Need for Additional Information***

The Pre-Application Document (PAD) provides limited information on the distribution or abundance of freshwater mussels within the West Branch of the Penobscot River/within the vicinity of the Ripogenus and Penobscot Mills projects (a freshwater mussel survey was last performed in parts of the West Branch by IFW in 2009). At that time, there were yellow lampmussel (*Lampsilis cariosa*) identified, but no brook floater (*Alasmidonta varicosa*), and tidewater mucket (*Leptodea ochracea*) was not mentioned. The Service notes, since the last survey performed by IFW, the brook floater has been deemed a priority at-risk species. Without an updated, robust, mussel survey, focused on project-affected areas, the Service cannot determine what, if any, measures are needed to ensure their protection.

***Nexus to Project Operations and Effects***

If mussels occur in the headpond, routine maintenance activities that require drawing the impoundment down could strand them, leaving them vulnerable to desiccation or predation. Likewise, the projects are not operated in instantaneous run of river mode, resulting in rapid flow fluctuations downstream of the tailrace. Freshwater mussels are relatively sessile animals and therefore susceptible to desiccation and/or predation if water surface elevations recede too quickly and/or drop too low.

According to the PAD, the distribution and abundance of freshwater mussels, within the West Branch, has not been assessed since 2009 and, based on Figure 5.4-4 in the PAD, all areas of concern to the agencies (related to any potential project-affected river reaches) have not previously been surveyed.

Updated information on the distribution and abundance of freshwater mussels, including the brook floater, in the vicinity of the Projects is needed in order to determine the impact project operations may have on these aquatic invertebrates.

***Methodology Consistent with Accepted Practice***

The Service requests a mussel survey be conducted at each dam associated with Ripogenus and Penobscot Mills. Since field identification of freshwater mussels can be quite difficult, we recommend that the Applicant hire a freshwater mussel expert to perform the assessment.

In general, the surveyor(s) should use snorkel or dive equipment to perform the assessment (depending on the depth of water). The impoundment effort should focus on the upstream extent of the headpond as well as littoral areas down to the lowest expected elevation during current

peaking operations and routine drawdowns for maintenance. Each bypass reach in its entirety should be surveyed. Downstream of each tailrace, the survey should focus on near-bank areas, island complexes/shoals, riffles, and shallow runs (i.e., those habitats most likely affected by flashboard failure and SAR operations). Results should include the number of each mussel species observed, the location and condition of each mussel, and the habitat in which it was found.

Should any federally listed, or priority at-risk species, be found at the East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, or Ripogenus dam, the Service reserves the right to request an Instream Flow Incremental Methodology study.

***Level of Effort/Cost, and Why Alternative Studies Will Not Suffice***

The expected level of effort and anticipated costs will be comparable to those experienced on similar FERC projects of this size, overall costs may range $20,000 to $30,000. No alternatives are proposed.

# Terrestrial Wildlife and Botanical Resources Study
(Ripogenus, P-2572 and Penobscot Mills, P-2458)

***Goals and Objectives***

The goal of this study is to (1) to characterize and describe the terrestrial wildlife and botanical resources that are currently representative of upland habitats within, and adjacent to, the Project's boundaries to evaluate potential project impacts from current or future operations and maintenance activities; and (2) compare baseline data collected during the last licensing proceeding with current conditions of the terrestrial, wildlife, and botanical resources community distribution (and data collected for other species, and their diversity, as relevant).

The specific objectives of the field study, at a minimum, include:

1. survey and inventory overall existing upland wildlife habitats;
2. note the occurrence of wildlife sightings during the course of the surveys;
3. survey and inventory vegetation cover classes and land use;
4. survey and evaluate the presence of targeted rare threatened or endangered species or associated habitats;
5. survey and inventory the nature and extent of upland invasive and exotic vegetation species; and
6. compare the current species diversity and distribution with the species diversity and distribution collected during the last licensing proceeding.

***Resource Management Goals***

The Service seeks the accomplishment of a number of resource goals and objectives through the relicensing process for the Project. General goals include the following:

1. Ensure that protection, mitigation and enhancement measures are commensurate with Project effects and help meet regional fish and wildlife objectives for the basin.

2. Conserve, protect, and enhance the habitats for fish, wildlife, and plants that continue to be affected by the Project.

Specific to terrestrial wildlife and their habitats, the Service's goals are:

1. Protect, enhance, or restore diverse high quality terrestrial habitats for plants, animals, food webs, and communities in the watershed and mitigate for loss or degradation of these habitats.

2. Minimize existing and potential negative Project effects of ongoing operation and/or maintenance activities on terrestrial wildlife and vegetation.

3. Protect habitat important to the persistence of the federally threatened northern long-eared bat (*Myotis septentrionalis*) (NLEB) and Canada lynx (*Lynx canadensis*) within the Project boundary.

Our study requests are intended to facilitate the collection of information necessary to conduct effects analyses and to develop reasonable and prudent conservation measures, and protection, mitigation, and enhancement measures pursuant to the Endangered Species Act of 1973, as amended (16 U.S.C. §1531 *et seq*.), the Fish and Wildlife Coordination Act, as amended (16 U.S.C. §661 *et seq*.), and the Federal Power Act (16 U.S.C. §791a, *et seq*.).

***Public Interest***

The requestor is a natural resource agency.

***Existing Information***

Appendix F of the Pre-Application Document (PAD) lists the plant species that existed at Ripogenus and Penobscot Mills in the early 1990's, information that was collected during the last relicensing. However, there is no information in the PAD pertaining to how botanical resources may have changed over time. Further, while Table 5.5-5 and 5.5-6 provides a list of invasive plants found within the state of Maine, none are explicitly identified as occurring within the Ripogenus and Penobscot Mills project areas. Likewise, the lists of mammals, birds, amphibians and reptiles are only those that may occur at each development associated with each of the six developments.

These information gaps need to be filled so that the resource agencies can assess any potential impacts related to project operations and develop adequate protection measures to meet management goals and objectives. Plants and wildlife occurring in habitats in the project areas may benefit from protection, mitigation, and enhancement measures, given the potential effects of current and future operations and maintenance activities.

***Nexus to Project Operations and Effects***

The Project area contains habitat suitable for the Northern Long-Eared Bat and may contain habitat suitable for Canada lynx and their designated critical habitat and, according to the PAD, multiple State-listed species may occur in the vicinity of the projects (at all six developments). GLHA states it is not proposing any new construction, changes to current land management practices, or new land management activities as part of this licensing proceeding. However, the PAD provides no description of the types of land management practices that GLHA currently employs. Without knowing what terrestrial resources currently exist and what wildlife occurs in the project areas (or what types of land management and/or maintenance activities GLHA routinely undertakes) the Service is unable to determine if impacts are currently occurring or if they may occur under any new conditions that could be imposed via a new license (e.g., additional recreational amenities such as trails).

***Methodology Consistent with Accepted Practice***

The Service recommends that GLHA follow the methodology detailed in FirstLight's Study Plan 3.4.1, as described in the Revised Study Plan for the Turners Falls Hydroelectric Project (No. 1889) and Northfield Mountain Pumped Storage Project (No. 2485) filed with the Commission on August 14, 2013. Pursuant to the Study Plan Determination issued on September 13, 2013, the Commission approved FirstLight's proposed methodology; therefore, it is consistent with accepted practice.

In general, the study should consist of two tasks. The first task is a literature review to collect information needed to develop vegetation type maps and calculate the percentage of each vegetation type present (including any coarse woody material) in the study area. The second task is to conduct field surveys to document wildlife habitat and occurrence, vegetative cover types, and invasive plant species in the project areas.

According to the PAD, there are known bald eagle nesting and roosting sites along the impoundments associated with the projects. During field surveys, biologists should conduct surveys of bald eagle nests, feeding concentrations, and roosting sites using standard aerial methodology used by state and federal wildlife agencies. Aerial nest surveys should be conducted annually within a half mile of the shoreline of wetlands, rivers, streams, and beaver flowages in April of 2022 and 2023. Where encountered, bald eagle nests and roosting trees should be GPS-located and photo-documented.

The study report should include:

1. maps of the project areas showing locations and extent of habitats, vegetative cover, locations of invasive species, and known eagle roosting and nesting trees (as both polygons and point locations, as appropriate);
2. forest stand maps showing information like stand tree composition, age, height, and stocking density to determine if lynx habitat is present with the Ripogenus and Penobscot Mills project areas;
3. tabular summaries of the data;
4. an assessment of project effects (operations, maintenance activities, potential future recreational amenities, etc.) on terrestrial habitat, wildlife, and habitat connectivity at the Projects;
5. recommendations for any necessary plant, habitat type, or wildlife protection and/or invasive species control measures, including riparian buffer restoration and protection of key nest and roost trees for bald eagles.

***Level of Effort/Cost, and Why Alternative Studies Will Not Suffice***

This study will likely take two seasons to complete. A similar study being undertaken by FirstLight as part of the relicensing of its Turners Falls (FERC No. 1889) and Northfield Mountain Pumped Storage (FERC No. 2485) projects was estimated to cost $60,000 to $80,000.

As the scope of the two studies are similar in size, the Service estimates it will cost GLHA $60,000 to $80,000 to complete the requested study. No alternatives are proposed.

GLHA Study Request #9

# Northern Long-Eared Bat Acoustic Survey
(Ripogenus, P-2572; and Penobscot Mills, P-2458)

***Goals and Objectives***

The goal of this study is to determine whether the Northern Long-Eared Bat (NLEB) is present within the Ripogenus and Penobscot Mills Project boundaries.

The specific objective of the field study is to conduct an acoustic survey for NLEB during the summer period to document presence/absence of the species.

***Relevant Resource Management Goals***

The Service seeks the accomplishment of a number of resource goals and objectives through the relicensing process for the Project. General goals include the following:

1. Ensure that protection, mitigation and enhancement measures are commensurate with Project effects and help meet regional fish and wildlife objectives for the basin.

2. Conserve, protect, and enhance the habitats for fish, wildlife, and plants that continue to be affected by the Project.

Specific to the NLEB, the Service's goals are:

1. Protect, enhance, and restore diverse foraging and roosting habitat (maternity and non-maternity) for the NLEB.

2. Avoid NLEB mortality by conducting tree removal outside the time of year NLEBs are utilizing forest habitats for roosting (April 20 through October 15).

The NLEB is a federally threatened species. As such, this study request is intended to facilitate the collection of information necessary to conduct effects analyses and to develop reasonable and prudent conservation measures, and protection, mitigation, and enhancement measures for the species pursuant to the Endangered Species Act of 1973, as amended (16 U.S.C. §1531 *et seq*.).

It is the goal of the Service to recover the NLEB so that it can be removed from the list of threatened species in the future. An acoustic survey may also provide some information regarding the presence of the little brown bat (*Myotis lucifugus*) and tri-colored bat (*Perimyotis subflavus*) within the project boundaries. Both species are currently undergoing consideration for listing by the Service under the Endangered Species Act.

***Background and Existing Information***

Although bat survey work in Maine has typically been rather limited and we are not aware of any prior surveys on Project lands, mist-netting surveys conducted in several locations in Piscataquis County in 2006 and 2008 captured several NLEB indicating that the species could be present. The Pre-Application Document (PAD) indicates NLEB has been documented as a species potentially occurring in the vicinity of the projects and based on the vegetative community descriptions in the PAD, the project areas likely contain habitat suitable for the NLEB. However, baseline information regarding the presence/absence and distribution of the NLEB within the Project area is lacking. These data are needed in order to meet the goal of evaluating project effects. If NLEBs are present within the project area, they may benefit from protection, enhancement, and mitigation (PME) measures, given the potential effects of current and future operations and maintenance or enhancement activities on project lands.

***Nexus to Project Operations and Effects***

The Project consists of the East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, and Ripogenus dams. Based on vegetative community descriptions provided in the PAD, the project areas likely contain habitat suitable for the NLEB. While GLHA acknowledges that the NLEB may exist in the Project vicinity, it maintains that continued operation of the Project is unlikely to have any effect on NLEB populations. Even though GLHA is not proposing any new construction, land management activities that could impact bat habitat or hibernacula could change as a result of the relicensing process. For example, additional recreational trails could be a requirement of any new license issued for the projects. Those trails could require that trees be cut, which could result in bat mortality if the removal occurs during a time when bats are unable or unwilling to flee a tree that is felled when they are inside. Without knowing if, and where, NLEBs occur within the project areas, the Service cannot determine if existing operations (e.g., maintenance activities on project lands) or future activities could result in adverse effects to NLEB populations.

***Methodology Consistent with Accepted Practice***

The Service requests that GLHA conduct a bat survey following the Service's current-year summery survey protocol for the NLEB, which can be found at the following website: https://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html.

In general, survey methodology should consist of having a qualified acoustic surveyor conduct acoustic surveys during the summer period (May 15 through August 15). In accordance with Service guidance, non-linear projects should have a minimum of four detector nights per 123 acres of suitable summer habitat, with two detector locations per 123-acre "site" being sampled until at least four detector nights have been completed over the course of at least two calendar nights.

To maximize the quality of recorded echolocation calls, detectors should be positioned at least 1 meter off of the ground, at an angle ≥45 degrees, and with PVC tube weatherproofing. The

acoustic sampling period for each site must begin at sunset and end at sunrise each night of sampling.

Data analysis should consist of using currently available approved[10] acoustic bat identification programs to determine if positive detections of NLEB calls were recorded.

A report of the acoustic survey results should include:

- an explanation of any modifications from the original survey plan;
- a description of acoustic monitoring sites, survey dates, duration of survey, weather conditions, and a summary of findings;
- a map identifying acoustic monitoring locations and a corresponding table including the GPS coordinates;
- a table with information on acoustic monitoring and resulting data, including detector GPS coordinates, survey dates, survey hours;
- detailed analysis and results of any qualitative acoustic analysis conducted where a program(s) considered NLEB presence likely, including justification for rejecting any program MLE results (if applicable); and
- photographs of each acoustic site documenting the location of the detector, the orientation of the detector, and the detection cone.

The methodologies described here are consistent with commonly accepted practices.

***Level of Effort/Cost, and Why Alternative Studies Will Not Suffice***

The study should take one field season to complete. The level of effort required is moderate. Given the amount of potentially suitable habitat, the Project area may contain 10 or more survey sites with 40 or more detector nights. The Service estimates it will cost GLHA $20,000 to $40,000 to complete the requested study. No alternatives are proposed.

[10] Currently approved bat identification software programs to be used in conjunction with the NLEB presence/absence summer survey protocols can be found at the following website: https://www.fws.gov/midwest/Endangered/mammals/inba/surveys/inbaAcousticSoftware.html.

Emelie A Ferland, Vassalboro, ME.

October 7, 2021

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Re: Project Number: 2572-133, Docket Number: P-2572 and Sub Docket Number: 133
Ripogenus Dam

Dear Ms. Bose:

We purchased our camp on Timberland Road on Caribou Lake as a retreat for fishing, boating and other recreational water uses.

The water level of Caribou Lake in the past 2 years has been lowered to a point where we are unable to navigate with our boat up into Chesuncook Lake. As of July 4th weekend 2021, the shorefront was approximately 200 feet from the shoreline. In previous years, it was less than half the distance during the same time frame. We are unable to launch our 16-foot boat at our location or at the public boat launch provided by Brookfield off the Golden Road due to such low lake levels. The low water level has also impacted our ability to get water to the camp.

Other lakes in the Penobscot watershed have seasonal draw down limits, i.e. North & South Twin Lake. We respectfully request that similar limitations on the drawdowns by the dam be limited to certain thresholds at certain times of the year as with these other lakes.

If the lake levels continue to drop, the value of our property will be negatively affected. We hope that F.E.R.C. will take into consideration public use of the lake and waterways that we so strongly support and enjoy.

Thank you for your consideration.

Sincerely,

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989





October 7, 2021

Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E. Washington DC 20426

Dear Secretary Bose,

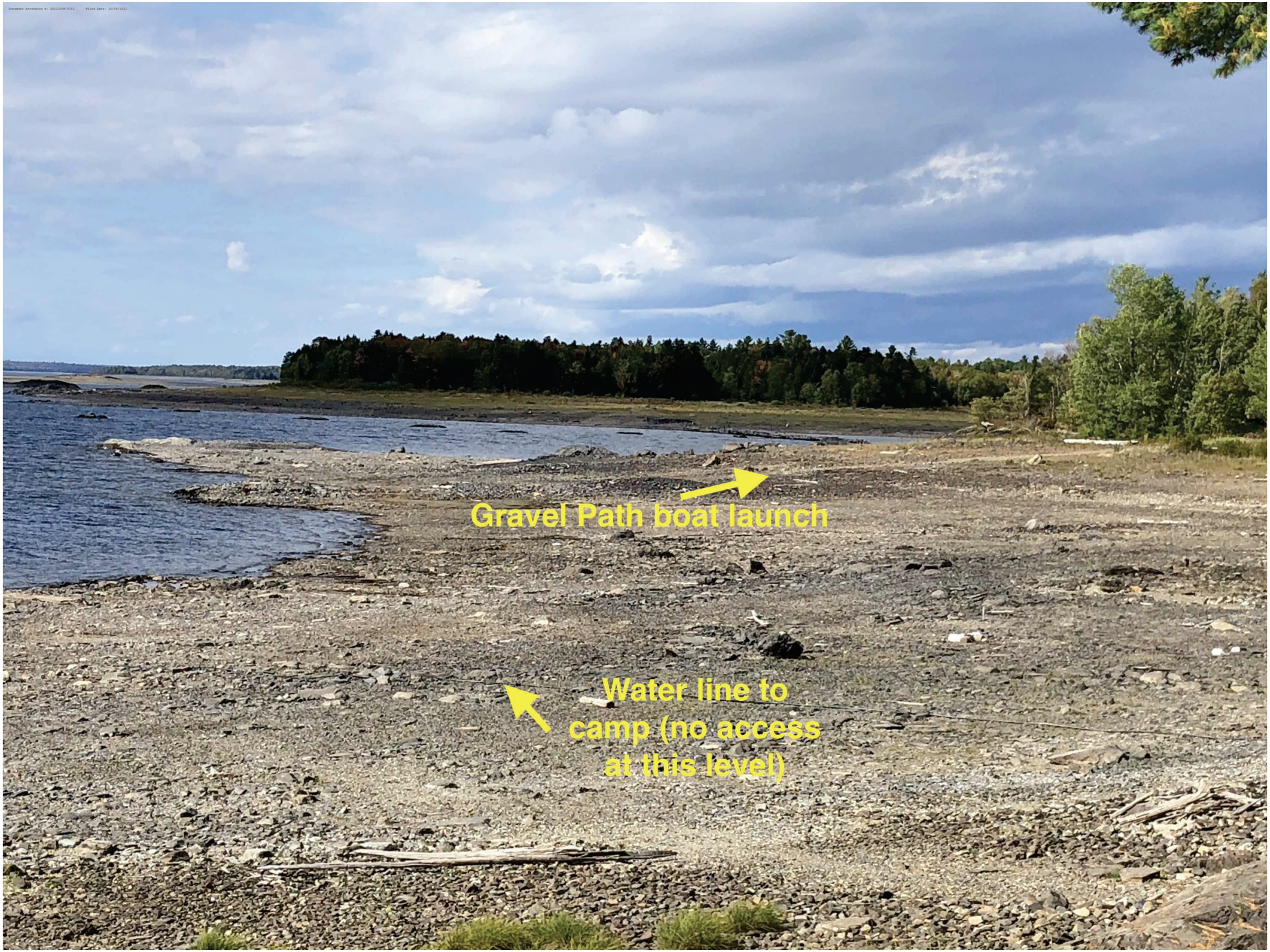
I'm writing today to provide comments on the PAD over the relicensing of the Ripogenus Hydroelectric Project (P-2572-133). I currently serve as the primary caretaker of our family's recreational camp on Chesuncook lake, which has been in our family since my grandfather purchased the camp in March of 1983. I have been visiting this incredible place for the past 30+ years and have many fond memories of fishing, viewing wildlife, and learning from the generations before me at our remote cabin in the North Maine Woods.

Over the past several years we have seen declining lake levels over the summer months that have greatly impacted the use of Chesuncook lake in a recreational manner during the late summer and early fall months. The drastic lowering of lake levels over the summer have introduced navigational hazards in the form of large rocks, emergence of rock pilings (including the existing retired dam leading from Chesuncook to Ripogenus lake), and submerged stumps/logs. The emergence of these hazards, which in former years have been far under water, has resulted in damage to my boat in the form of dented hulls and motor damage, specifically propeller damage. Additionally, the lowering of the lake to the levels seen in the past few years makes traveling from Chesuncook to both Caribou and Ripogenus Lakes nearly impossible. Admittedly, low snow melt and runoff the past two springs have failed to "fill" the lake in the spring months leading to even lower lake levels in the late summer/fall of both 2020 and 2021 (pictures included for reference). In addition to these navigational hazards, access to public campsites managed by the Department of Conservation becomes very difficult and recreational boat access to the lake becomes essentially non-existent. The current relicensing plan details that GLHA will "continue to operate and maintain the 11 recreation sites", which includes the public launch at Chesuncook lake as well as the boat "put-in" on Caribou lake. Under the current proposed renewal plan, the public launch at Chesuncook lake has not been "maintained" in many years and with current draw down of the lake, was not accessible for boats larger than 16 feet in the fall of 2020 and 2021 (for reference, my boat is 19 feet, and I am unable to launch this boat at this public access point). As currently written, the PAD would allow for a targeted seasonal draw down range of 28 feet. If this plan were to continue, we will continue to see an inability to utilize this watershed for recreational purposes given the above mentioned hazards. Futhermore, the current draw down allowance specified in the PAD shows the contrast between the draw down plan at Chesuncook lake compared to other large lakes in the region. Even within this same document, the required level of North Twin Lake is set to be within one and one half feet of full from Memorial Day until the end of August and no more than 3.5 feet by October. I ask that a similar draw down restriction be placed on the Ripogenus impoundment as well, being the upstream source of the North Twin Watershed.

I would like to advocate that the relicensing plan requires GLHA to partner with state/federal agencies as well as conservation groups (including but not limited to the Department of Conservation Bureau of Parks and Lands, Maine Department of Inland Fisheries and Wildlife, U.S. Fish & Wildlife Service, Trout Unlimited, and others) to conduct additional impact studies on the fisheries and wildlife in the Ripogenus watershed. The scoping document states that GLHA will continue to support and collect information on impact of aquatic resources, wildlife and botanical resources, and recreational resources. The data included within the PAD is not up to date and photographs do not reflect the current state of the lake, nor the public access to the lakes. I would specifically like to request impact studies as they pertain to ongoing management projects by the Maine Department of Inland Fisheries and Wildlife surrounding Landlocked Salmon populations in the watershed. The low water levels seen in the past several fall seasons certainly put stress on fish spawning areas, but we do not know what the true impact is without fisheries studies.

Thank you for your time and for taking my comments into consideration.

Wes Zemrak
2 Brookside Drive
Falmouth, Maine 04105
wzemrak@gmail.com
Cell: 401-447-7855


Gravel Path boat launch
Water line to camp (no access at this level)

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Great Lakes Hydro America, LLC
Application for New License

Ripogenus Hydroelectric Project
FERC No. 2572

Penobscot Mills Hydroelectric Project
FERC No. 2458

# AMERICAN WHITEWATER AND APPALACHIAN MOUNTAIN CLUB COMMENTS & STUDY REQUESTS IN RESPONSE TO NOTICE OF INTENT TO FILE LICENSE APPLICATION, FILING OF PRE-APPLICATION DOCUMENT (PAD), COMMENCEMENT OF PRE-FILING PROCESS, AND SCOPING; REQUEST FOR COMMENTS ON THE PAD AND SCOPING DOCUMENT, AND IDENTIFICATION OF ISSUES AND ASSOCIATED STUDY REQUESTS REGARDING THE RIPOGENUS HYDROELECTRIC PROJECT (P-2572) AND PENOBSCOT MILLS HYDROELECTRIC PROJECT (P-2458)

American Whitewater ("AW") and Appalachian Mountain Club ("AMC") submit the following Comments and Study Requests in response to the filing of the Pre-Application Document (PAD) for the Ripogenus Hydroelectric Project and Penobscot Mills Hydroelectric Project (FERC Project Nos. P-2572, P-2458) by Great Lakes Hydro America, LLC ("GLHA") Collectively, these projects are located on the West Branch of the Penobscot River and Millinocket Stream and are comprised of the Ripogenus Hydroelectric Project and the Millinocket Lake Storage, North Twin, Millinocket, Dolby, and East Millinocket developments as part of the Penobscot Mills Hydroelectric Project. While GLHA holds separate licenses for the Ripogenus and Penobscot Mills projects, the licensee has appropriately filed a joint Pre-Application Document, because GLHA is the licensee for both projects, they have the same license expiration date, and the operations of both projects are inextricably linked. Inasmuch as these projects have cumulative impacts on both developmental and non-developmental resources, we are filing these comments and study requests as a single document under each FERC docket to support a coordinated approach to the relicensing of these projects and to advocate for the preparation of a single NEPA document addressing the cumulative impact of all six developments.

American Whitewater is a national non-profit 501(c)(3) river conservation and recreation organization founded in 1954. With approximately 6,000 members and 100 affiliate clubs, representing tens of thousands of whitewater paddlers across the nation, American Whitewater's mission is to protect and restore our nation's whitewater resources and to enhance opportunities to enjoy them safely. Our members are primarily conservation-oriented kayakers and canoeists, many of whom live and/or engage in recreational boating in the New England region within easy proximity of the Penobscot River. American Whitewater has long been involved with the FERC licensed hydropower projects in the Maine, including hydropower projects located on the Penobscot, Kennebec, Rapid, and Magalloway rivers, and are party to settlement agreements that provide for whitewater boating opportunities that partially mitigate for project impacts.

Since 1876, the Appalachian Mountain Club has promoted the protection, enjoyment, and understanding of the mountains, forests, waters, and trails of the Appalachian region. AMC is the largest conservation and recreation organization in the Northeast with more than 90,000 members, supporters, and advocates, many of whom visit the lands and waters upstream and downstream of the projects for recreation.

## Comments

The West Branch of the Penobscot River is one of the nation's premier natural, scenic, and recreational wonders. Water flowing over many millennia has sculpted the bedrock, river channel and landscape from the Ripogenus Gorge to Millinocket into a series of remarkable geological and scenic features that make this river a unique recreational and natural resource. The continued operation of large hydroelectric power plants, dams and other associated structures degrades the public's use and enjoyment of this unique and spectacular public resource.

## Project Facilities and Operations

From the top of the Ripogenus impoundment to the East Millinocket tailrace, these storage projects and hydropower dams impact more than 40 river miles of the West Branch of the Penobscot River and more than 12 river miles of Millinocket Stream. The uppermost development, Ripogenus Hydroelectric Project, obstructs more than 20 miles of the West Branch of the Penobscot River by diverting flows at the Ripogenus Dam into a 3,850-foot-long penstock leading to the McKay Station powerhouse. The drainage area at the project is 1422 sq. mi. The flow diversion at Ripogenus Dam regularly diverts nearly all flows from the West Branch of the Penobscot River, virtually dewatering the Ripogenus Dryway or Upper Gorge of the natural river channel other than an unnatural steady state minimum flow of 100 cfs from July 1 to September 30 to attract adult salmon for recreational fishing during the summer months. At other times, GLHA leaves the Upper Gorge dewatered except for leakage of 12 cfs.

The minimum flow in the bypassed reach is 0.07 cubic feet per second per square mile (cfsm) of the drainage area during the summer months and 0.008 cfsm during the rest of the year, far below the United State Fish and Wildlife Service recommended base flow of 0.5 cfsm necessary to support healthy aquatic habitat. The flow diversion and dewatering of the natural river channel below the Ripogenus Dam impacts aquatic habitat, obstructs river connectivity, reduces sediment transport, degrades water quality, reduces recreation opportunity, and degrades the aesthetic quality of the Ripogenus Dryway.

From the top of the Ripogenus impoundment to the McKay Station tailrace, the dewatered natural river reach drops about 84 feet over the .75-mile natural river channel. While the licensee does not include a description of the geologic features in the bypassed reach, imagery of and accounts by whitewater paddlers of this reach shows that this river reach contains a continuous series of ledges and features that provide high-quality whitewater boating opportunity when sufficient flows are provided. Additionally, the licensee acknowledged in its prior license application that the Upper Gorge is an aesthetic feature in the project boundary that draws

visitors to the project to hike and view the falls in its present dewatered condition. There are no scheduled whitewater boating releases in the Dryway, and the licensee does not provide information on the frequency with which flows are spilled into the natural river reach when the pond is full, and inflows exceed the 3500 cfs combined capacity of the three turbines at McKay Station. McKay Station is a 38.6 MW powerhouse that operates in hydropeaking mode by fluctuating the upstream impoundment. Given the allowable impoundment drawdown of 44 feet at Ripogenus and the licensee's interest in avoiding spillage, we assume that spillage into the Upper Gorge is infrequent outside of the spring freshet.

The lack of publicly available Chesuncook lake elevation information and historic flow data at Ripogenus makes it difficult to assess the impact of project operations on flows below McKay Station. Based on the information provided in Figure 4.4-1 in the PAD, project outflows can be as low as 400 cfs when the project trips offline, an increasingly common occurrence. More commonly, the project releases a minimum flow of 1000 – 1400 cfs depending on the time of year to support fish spawning, incubation, and habitat. In addition, the licensee releases flows ranging from 1800 – 2300 cfs to provide recreational boating opportunity from May through September during daytime boating hours. The frequency with which the licensee exceeds these minimum flows is unknown, and we look forward to the licensee providing historic operational flow data through the relicensing process so that we can more fully evaluate the impact of project operation on non-developmental resources.

Below McKay Station, project outflows cascade over the 15-mile premier whitewater boating reach between McKay and Debsconeag before flowing into Ambajejus Lake in the North Twin Development impoundment and diversion dam located 21 miles below McKay Station. Like McKay, North Twin is a peaking operation relying on storage from the four lakes that comprise its impoundment. North Twin impoundment lake levels fluctuate throughout the year from 1.5 feet after spring refill to 3.5 feet during the late summer to 12 feet or more during the winter months. Flows into the North Twin Impoundment come from releases from Ripogenus and tributary inflow as well as water pumped from the Millinocket Lake Storage Development.

Flows into North Twin are augmented by the Millinocket Lake Storage Development pumping water into Ambejejus Lake in support of hydropeaking operations at North Twin. Impoundment levels at Millinocket Lake Storage Development fluctuate 10 feet because of its pumping for North Twin Station as well as the release of an unnatural steady state minimum flow of 60 cfs from Millinocket Lake Dam into the 9.4-mile reach of Millinocket Stream between Millinocket Lake and Shad Pond below the Millinocket Development. The pumping at Millinocket Lake diverts flows that would otherwise be available for downstream flows on Millinocket Stream, eliminates natural flow variability beneficial to aquatic habitat and recreation, degrades water quality, and increases the hydropeaking on the West Branch of the Penobscot in the Penobscot Mills project area.

The North Twin Dam, located 33 miles below the Ripogenus Dam, is a 7 MW hydropower development with three turbines with a combined hydraulic capacity of 4500 cfs. The powerhouse, located adjacent to the North Twin Dam, operates in hydropeaking mode fluctuating flows from a minimum flow of 2000 of 3000 cfs up to the 4500 cfs hydraulic capacity of the project. Project outflows are released into a riverine reach leading to Quakish

Lake, the impoundment for the Millinocket Development located 2.6 miles below the North Twin Dam.

Inasmuch as Quakish Lake has negligible storage capacity, the licensee's characterization of its operations at Millinocket and the lower developments as run-of-river is misleading in several respects. The Penobscot Mills Hydroelectric Project is a hydropeaking project from North Twin to East Millinocket because each hydropower development is successively passing peaking flows from the upstream development. None of these developments can be characterized as run-of river because they generate power based on the peaking flow regime at North Twin and rely on the operational flexibility provided by the North Twin and Millinocket Lake storage reservoirs. Characterizing the Millinocket Development as run-of-river obscures the substantial impact of project operations by implying that it passes natural flows and protects the natural flow regime.

More significantly, the 37 MW Millinocket Development dams and diverts the West Branch of the Penobscot River at Stone Dam where the current license requirements fail to mandate any minimum or naturally variable flow into the 4.5-mile natural river channel of the Penobscot River leading to Shad Pond, a section of the Penobscot River that the licensee incongruously calls the "Back Channel". While the Licensee is required to release a minimum flow of 3000 cfs from North Twin Development from August 22 through October 15 and 2000 cfs from Shad Pond at other times, no minimum or naturally variable flows are passed at Stone Dam, leaving the natural river channel nearly dewatered at most times. The only flow in the natural river is from tributary inflow in the lower reach when available and at times when upstream flows exceed the 4305 cfs hydraulic capacity of the Millinocket powerhouse, primarily during the spring runoff as shown on the image below.




*West Branch of the Penobscot River Below Stone Dam Showing Spillage*



*West Branch of the Penobscot River Below Stone Dam at Grand Falls Showing Spillage*

Flows from Millinocket Development, Millinocket Lake Storage Development, and leakage or spill from Stone Dam converge on Shad Pond downstream from Millinocket Development with a required minimum flow of 2000 cfs leading to the Dolby impoundment. Like Millinocket, the licensee mischaracterizes the Dolby Development as run-of-river. In reality, the Millinocket, Dolby, and East Millinocket Developments, like Ripogenus and North Twin, are hydropeaking projects that successively pass altered flows from the upstream developments rather than passing unaltered flow or reregulating discharges to more closely mimic the natural flow regime.

The Dolby Development, located approximately 8 miles below the Millinocket Development and approximately two miles above East Millinocket Development, has a 16.5 MW powerhouse with a hydraulic capacity of 4350 cfs. According to the PAD, both Dolby and East Millinocket have negligible usable storage, although it is unclear from the PAD whether the Dolby Pond maintains a level impoundment. It appears that there is some level of fluctuation based on historical imagery. Flows from the Dolby tailrace flow into the West Branch of the Penobscot River to the 6.9 MW East Millinocket Development located 1.9 miles downriver. The Drainage area at East Millinocket is 2,111 sq. mi.. East Millinocket powerhouse has a combined hydraulic capacity of 4200 cfs.

**Impact of Project Facilities & Operations**

- Aquatic Habitat & Fish Passage

For more than a century, the dams on the mainstem and tributaries of the Penobscot River have decimated native species of sea-run fish including Atlantic Salmon and Shad. While efforts over the past two decades have resulted in the removal of the Veazie and Great Works dams, improvements to fish passage, and opening of hundreds of miles of habitat, the continued presence of hydropower dams continue to have deleterious effects on numerous fish species and recreation opportunity. The harm caused by the hydropower dams on the Penobscot is evident in the licensee's dams at East Millinocket, Dolby, Millinocket, North Twin, and Ripogenus. Once home to Atlantic Salmon, river herring, and other native fish species, what remains today is a managed fishery with landlocked Salmon, Rainbow Trout smelt, and warm water fish species. Restoration of the Penobscot River will require an assessment of each dam along the mainstem and tributaries to provide meaningful improvements for fish passage through the relicensing process.

Fish passage at the Penobscot Mills and Ripogenus hydroelectric projects is virtually nonexistent except for North Twin where passage is provided for landlocked Salmon between the Millinocket and North Twin impoundments. The dewatering of bypassed reaches below the Ripogenus and Millinocket dams has eliminated habitat that would be otherwise suitable for various species. The East Millinocket and Dolby projects lack any fish passage for river herring and there are no Shad in Shad Pond. Restoration of the river reach from the Ripogenus impoundment to the East Millinocket tailrace will require the restoration of flows to dewatered river reaches, installation of appropriate fish passage at each development, and the restoration of a Shad fishery in Shad Pond.

- Whitewater Boating

The West Branch of the Penobscot River is known internationally as among the most important rivers for whitewater boating in the Northeast and draws tens of thousands of whitewater boaters annually seeking to enjoy the scenic beauty of the Penobscot River and its dramatic rapids. Paddlers traveling to the Maine Woods region have a positive economic impact on the region and support the outdoor recreation economy, impacts that far exceeds the value of power generated by these hydroelectric projects.

The West Branch of the Penobscot River, where the projects are located, is treasured by local residents and visitors to the area who enjoy boating, angling, swimming and hiking throughout the recreation season. Eco-tourism and outdoor recreation form the foundation of the local economy, relying heavily on the resources impacted by these projects. Unfortunately, project facilities and operations diminish recreation opportunities on the West Branch of the Penobscot River, and diminish the natural beauty of the area, obstructing natural river flow, dewatering dramatic waterfalls, rapids and other sections of the natural river essential to the enjoyment of designated and existing uses of these rivers. AW and AMC have identified four sections of the West Branch of the Penobscot River located in the project boundaries for the Ripogenus and Penobscot Mills projects as providing high quality whitewater boating opportunities. These sections are as follows:

**Ripogenus Dryway:**

The section of the West Branch from Ripogenus Dam to McKay Station, known as the Upper Gorge or Ripogenus Dryway, is a .75-mile reach with sufficient gradient structure to provide a highly valuable whitewater boating opportunity with sufficient flow. This section of the West Branch cascades over a series of ledges and other geologic features through a remote, narrow gorge setting before paddlers enter the lower gorge below McKay Station. This section has been periodically run by paddlers during spillage from the Ripogenus Dam, demonstrating that this section should be considered a whitewater boating resource. Unfortunately, opportunities to boat this section are infrequent as they only occur when flows are above station capacity, or when the project is offline. The aesthetic quality of this reach also attracts hikers along the Upper Gorge Trail. While precise flow ranges for this section of the river are unknown, anectodical information from those who have previously boated this reach shows that the Ripogenus Dryway is boatable at flows at 400-2200+ cfs and provides flows in the Class III/IV range of difficulty. These flows within the normal operating range of the project and would require that the licensee forego generation and restore natural river flows in the Ripogenus Dryway.




*Ripogenus Dryway*



*Ripogenus Dryway at base flow conditions*




*Ripogenus Dryway from the crest of Ripogenus Dam*



*Ripogenus Dryway during a high flow event showing whitewater paddling features*

**McKay Station:**

The West Branch of the Penobscot River below McKay Station is the arguably the most renowned whitewater river in the northeast, its closest comparable river reach being the Gauley River in West Virginia. The upper section below McKay features a series of Class III – V rapids through the Penobscot Gorge and Cribworks sections to Big Eddy. This section of the West Branch is known for its powerful hydraulics, waterfall drops, stunning views of Mount Katahdin and frequent wildlife sightings. The 15-mile reach down to Debsconeag provides both rafters and private boaters with an unequaled boating opportunity in the region.

Under its current FERC license, the licensee is required to release daytime flows ranging from 1800-2300 between May 1 – October 1 with flows varying within this range depending on the day of week and hydrologic conditions. While this flow range is well utilized by both private boaters and commercial outfitters, the licensee has not conducted a controlled-flow whitewater boating study on this river reach using the widely accepted *Whittaker* protocols developed in 2005 to identify minimum acceptable and optimal flow ranges.



*Penobscot Gorge downstream of McKay Station*



*Cribworks Rapid on the West Branch of the Penobscot River near Telos Road*



*Rapids on the West Branch of the Penobscot River*

**Stone Dam:**

The Penobscot Mills Dryway or Stone Dam Dryway between Stone Dam and Shad Pond on the West Branch of the Penobscot River, is a 4.5-mile river reach that the licensee refers to as the "Back Channel", which has the potential to provide a highly valuable whitewater boating opportunity to paddlers with a wide range of abilities if sufficient flows were provided. Under current FERC license conditions, the licensee is not required to release any minimum flow into this lengthy river reach as all flows are diverted into the Millinocket powerhouse rather than flowing naturally into the river.

The flow diversion at Stone Dam and the dewatering of the 4.5-mile reach of the West Branch of the Penobscot River destroys aquatic habitat, obstructs sediment transport, reduces water quality, and eliminates valuable recreational boating and angling opportunities that would otherwise be available if sufficient flow were provided. This section of the river contains ample gradient and geologic features that would provide high quality aquatic habitat as well as whitewater boating and angling opportunities under appropriate flow conditions. The reach also contains Grand Falls, a significant geologic feature located 2.7 miles below Stone Dam. Rarely, flows are spilled over Stone Dam, except when upstream flows from North Twin exceed 4305 cfs and the impoundment is at capacity. Dewatered throughout the year except during high flows that are beyond the capacity of the project to store or generate power, the dewatered Grand Falls is a natural and recreational treasure along this reach significantly impacted by the projects.

Higher flows into the Back Channel can be released from an inflatable rubber flashboard system and is currently operated at times by deflating the pneumatic rubber flashboard system to provide flows of 200 cfs and then ramping up at an interval of 400 cfs an hour until downstream flow targets are met or until Stone Dam falls to 459.45 FTMSL.

This section of the West Branch has been run by numerous whitewater boaters when flows on the West Branch exceed the hydraulic capacity of the Millinocket Development. While this river reach is clearly boatable, minimum acceptable and optimal flow ranges are unknown, and the licensee has not previously performed a controlled-flow whitewater boating study using the widely accepted *Whittaker* protocols developed in 2005. Boaters previously paddling this reach have determined that this reach contains Class III/IV rapids that provide a high-quality whitewater boating experience under suitable flow conditions.



*Grand Falls on the West Branch of the Penobscot River below Stone Dam on the Penobscot Mills Dryway*

**Millinocket Stream:**

Millinocket Stream between Millinocket Lake and Shad Pond has the potential to provide whitewater boating opportunity if sufficient flows are provided. While there is no river gage and the licensee does not publicly release flow information on spill from the Millinocket Lake Dam, whitewater boating is an existing use on this 9.4-mile river reach during spill conditions. The licensee has not performed a controlled-flow whitewater boating study using the widely accepted *Whittaker* protocols, so precise flow ranges that would identify minimum acceptable and optimal flows are unknown. In its prior relicensing of the Penobscot Mills Hydroelectric Project, the licensee acknowledged the whitewater boating potential of this reach in response to FERC's AIR, stating that the reach between Millinocket Lake and Shad Pond is a recreational resource when flows greater than 250 cfs are released from the Millinocket Lake Dam including the Class III Locomotive Rips (or Choo-Choo Falls). While the information was solely based on a conversation with several boaters who previously paddled the reach, a more in-depth study is required to evaluate the recreational value of the resource more thoroughly.

**Consideration of Alternatives to Project Relicensing**

The licensee for the Ripogenus and Penobscot Mills hydroelectric projects have filed their Pre-Application Document with FERC and have stated their intent to seek new licenses that propose to continue existing operations for another 30-50 years. Relicensing provides FERC, resources agencies, NGOs and other stakeholders with an opportunity to explore alternatives to relicensing these projects under the current mode of operation. There is little doubt that many hydropower projects including some of these developments on the West Branch of the Penobscot River would not be constructed today due to their environmental impacts. We urge the licensees for these projects, state, and federal resource agencies responsible for evaluating environmental

impacts, and FERC as part of its NEPA review and economic valuation analysis to consider alternatives to relicensing including project decommissioning and dam removal as alternatives to relicensing.

**Comments on the Studies Proposed in the PAD**

For both the Ripogenus and Penobscot Mills projects, the applicant proposes a Recreation Facility and Inventory Assessment study. Considering the complexities of the projects, impacts of the projects on more than 60 miles of the West Branch of the Penobscot River and its tributaries, as well as the nationally significant recreation resources in and adjacent to the project boundaries impacted by the projects, the scope of the applicant's proposed Recreation Facility Inventory and Condition Assessment is inadequate and must be significantly expanded. Therefore, AW and AMC are requesting a "Recreation Facility Inventory, Recreation Use and Needs Assessment, Aesthetics and Reservoir Surface Area Assessment Study", which is detailed in the study request section of this filing.

The applicant's proposal (PAD 6-19 and 6-21):

| | | | |
|---|---|---|---|
| Recreation and Land Management | Recreation Facility Inventory and Condition Assessment | Characterize existing Project recreational facilities and conditions | Potential/relevant study methods may include:<br>• Field inventory and documentation of existing Project recreational facilities.<br>• Desktop research and inventory of regional recreational facilities, opportunities, and management plans.<br>• Identify gaps, improvements, or use needs within the Project boundary. |

The applicant's proposed study will be inadequate in assessing the impacts of the projects on recreation. First, the PAD identifies the project boundaries, which at the Ripogenus project, includes Chesuncook Lake, the Ripogenus Bypass and project facilities at McKay Station only. According to the PAD, below McKay Station, the project boundary does not include the river corridor of the West Branch of the Penobscot though the Ripogenus Gorge, to Telos Road, and below to Ambajejus Lake. Since the project boundary does not include the river corridor below McKay Station, the applicant's proposed study would not assess recreational use in this corridor, popular for whitewater rafting, floating, and fishing enhanced by project operations. A field inventory should include an assessment of all formal recreation facilities, informal facilities in the project boundary being used by the public for recreation, and all recreational uses, areas and facilities that are outside of the project boundary but directly impacted by project operations, such as river access locations between McKay Station and Ambajejus Lake. Non-project recreation areas are inextricably linked to the projects' operations and must be studied, such as those used by whitewater boaters and fisherman downstream of McKay Station. This information cannot solely be obtained through a desktop analysis as proposed and must include a field inventory of non-project recreation areas, as well as user intercept surveys to assess satisfaction, demand, and projected future needs. Since whitewater paddlers are accessing the river corridor at McKay station, for example, within the project boundary and most often taking off the river outside of the project boundary after traveling downstream, it is necessary to assess the adequacy of recreational facilities on non-project lands to ensure that project recreation facilities can meet current and projected use

Further, the proposed study will inadequately address the relationship between recreation and project operations at the project reservoirs. It is necessary to map the relationship between reservoir surface area and reservoir levels at all the projects, and to understand how reservoir use and recreation is impacted by lake levels fluctuated by project operations. A field inventory and desktop analysis must include a use and needs assessment conducted at a variety of reservoir elevations, with user surveys conducted within the full range of reservoir elevations allowed under the current license and within project operational ranges.

Finally, the proposed study fails to address the impacts of the projects on the aesthetic values of the reservoirs, river reaches, and other natural areas impacted by project operations. This component must be included within the scope of the study to ensure the public's satisfaction with the aesthetic values impacted by the projects. A dedicated Aesthetic Resource Study is requested to specifically assess the impact of project facilities on the surrounding landscape.

## Study Requests

The following study requests are requested for the Ripogenus and Penobscot Mills hydroelectric projects. While these projects are separately licensed by FERC, the projects are owned and operated by the same licensee, are in proximity to one another on the same river, and are closely related operationally. As such, we file these study requests jointly for both projects and expect that the licensee will undertake a joint study plan covering the entire study area from the top of the Ripogenus impoundment to the bottom of the East Millinocket tailrace including Millinocket Stream, project storage areas, and bypassed reaches.

- **Study Request 1: Recreation Facility Inventory, Recreation Use and Needs Assessment, Aesthetics and Reservoir Surface Area Assessment Study**

*Goals and Objectives*
§5.9(b)(1)
The goals of the Recreation Facility Inventory, Recreation Use and Needs Assessment, Aesthetics and Reservoir Surface Area Assessment Study are to:

1. Obtain information about the condition of existing formal and informal recreation facilities and access to lands and waters from the top of the Ripogenus impoundment to the bottom of the East Millinocket tailrace including Millinocket Stream, project storage areas, and bypassed reaches; and existing recreation use, and demand at the project and non-project locations in this area;
2. Evaluate the adequacy of existing access to areas in and adjacent to project lands including impoundments and bypassed reaches in the project boundaries and on lands from the top of the Ripogenus impoundment to the bottom of the East Millinocket tailrace including Millinocket Stream, project storage areas, and bypassed reaches, including formal and informal access areas that are utilized for boating, angling, hiking, and other recreational use;
3. Conduct an assessment of the need to enhance recreation opportunities and access from the top of the Ripogenus impoundment to the bottom of the East Millinocket tailrace including Millinocket Stream, project storage areas, and bypassed reaches;

4. Determine the minimum acceptable and optimal aesthetic flow in the bypassed reaches in the in the Ripogeus and Penobscot Mills projects including the Ripogenus Upper Gorge Dryway and the Stone Dam Dryway, as well as in Millinocket Stream sufficient to protect aesthetic values; and,
5. Quantify and map the relationship between reservoir surface area and reservoir levels, and how those reservoir elevations relate to recreation; and,
6. Inform the development of a Recreation Management Plan for the implementation of any enhancement measures and long-term monitoring of recreation demand and adequacy of project and non-project facilities over the term of new licenses.

§5.9(b)(2)
Not applicable.

§5.9(b)(3)
Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, aesthetics, and other non-developmental values of the project, as well as power and developmental values. Any license issued shall be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. Recreation and aesthetics have been identified as legitimate project purposes by the Commission. The Ripogenus and Penobscot Mills Projects, including reservoirs, bypassed reaches, and riverine reaches below the projects, have the potential to offer recreational opportunities unique to the region, provided that sufficient flow and access are provided.

*Background and Existing Information*
§5.9(b)(4)
The PADs provide a general description of public recreation facilities, activities, and recreational use at the projects. However, the PAD provides no detailed information regarding the condition of existing facilities or type or location of various uses as would be indicated by detailed user surveys and field data. The PADs provide no project-specific information regarding visitor perceptions and identified needs at the projects and areas impacted by the projects. Information on current use and whether existing access to facilities in the area are meeting recreation demand would inform a decision on whether additional designated public access at and near the projects is necessary to meet existing and future recreation demand at the projects. Further, no information is provided in the PADs regarding the impact of project operations on aesthetic values in the bypassed reaches, in each of the developments. American Whitewater maintains a rivers database representing the most comprehensive listing of whitewater boating resources in the nation including the river reaches on the West Branch of the Penobscot River impacted by these developments. The PAD describes only some of the whitewater boating resources at and near the projects but fails to adequately describe the significantly diminished opportunities for water-based recreation above, at, and below the projects due to project operations.

*Project Nexus*
§5.9(b)(5)

The projects include multiple reservoirs, bypassed reaches, and riverine reaches within and below the project boundaries, which are inherently attractive recreation features. An analysis of existing recreation uses and access at and near the projects would help form the basis for determining the projects' impacts upon, and ability to enhance, public recreation access opportunities. Flow over the dams and in the bypass directly impact both recreation use and aesthetics. Also, an assessment of the current level of recreation use would provide information necessary to develop a Recreation Management Plan for efficient management of the recreational components of the project over the term of a new license.

*Proposed Methodology*
§5.8(b)(6)
1. Provide the methods and results of the investigation of the existing recreation facilities conditions.

2. The facility inventory will include characterization of the suitability of the bypassed and riverine reaches below each development for whitewater boating (e.g., gradient, length, character of potential flows), angling, swimming, and other recreational uses.

3. The use and needs assessment will include all recreation activity types known to occur or potentially occurring in the project area, on both project and non-project lands and waters impacted by project operations. Specific methods should include visitor observations; on-site visitor intercept surveys at formal and informal public recreation areas at the project reservoirs, bypassed reaches, tailraces, and riverine areas; and mail and/or internet surveys targeting unique stakeholder groups that may not be practically accessed through on-site surveys (e.g., adjacent residential landowners, residents of the counties in which the projects are located, hikers, whitewater boaters).

4. The needs assessment will include the demand for whitewater boating, angling, swimming, and other recreational uses in the project area, feasibility of providing additional public access at the project reservoir and riverine reaches (potential locations, type of facilities and access, and any associated costs), identifying visitor perceptions regarding the adequacy of recreation facilities, and access in the project area, and assessing future recreation demand and facility needs at and near the project under different modes of operation.

5. The aesthetic assessment will include a range of alternate spillages that should be videotaped and qualitatively analyzed, and a demonstration study should be arranged for direct observation of flows by a team for subjective grading. Use of drone UAS platforms would be of considerable use in determining areas that are usually accessible only from the water or through terrain management. A rating form is employed to provide a structure for the individual observations.

6. Assess visitor perceptions of the effects of project operations and management on recreation and recreation opportunities at and near the project (including fluctuating reservoir levels, minimum flow releases, and anticipated changes) over a new license term. Identify potential measures to alleviate any negative effects as well as to enhance existing recreation opportunities and access.

7. A Recreation Management Plan for the projects should be included in the license application and should include, at a minimum:

(1) a description of any proposed protection, mitigation, and enhancement measures, including: location of any proposed facilities and/or access areas (including description and figure depicting the relationship of any proposed facilities to the existing project boundaries), proposed ownership and management of any proposed facilities, associated capital, and operation and maintenance costs; and a timeline for implementation;
(2) a description of operation and management measures associated with project-related recreation access and facilities;
(3) a description of measures for future monitoring of recreation demand and adequacy of project-related facilities to meet this demand over the term of new licenses; and,
(4) the impact of climate change on future recreational use and periodic review and amendment to the Recreation Management Plan to meet changing demand and use over the term of the new license.

*Level of Effort and Cost*
§5.9(b)(7)
The estimated cost of the Recreation Facility Inventory, Recreation Use and Needs Assessment, Aesthetics and Reservoir Surface Area Assessment Study for the reach between the top of the Ripogenus impoundment to the bottom of the East Millinocket tailrace including Millinocket Stream, project storage areas, and bypassed reaches should be reasonable providing that these licensee coordinates with AW, AMC, other stakeholders and the impacted communities to develop and implement the study plan. One field season should be sufficient to collect the required data and prepare the report.

- **Study Request 2: Controlled-flow Whitewater Boating and Access Study**

*Goals and Objectives*
§5.9(b)(1)
The goals of the Controlled-flow Whitewater Boating and Access Study are to:

(a) assess the presence, quality, access needs, flow information needs, and preferred flow ranges for river-based boating resources in a stepwise manner;
(b) assess the effects of a range of optimal and acceptable flows on whitewater recreation opportunities for whitewater paddling in the following river reaches: 1) Ripogenis Dryway between Ripogenus Dam and McKay Station; 2) McKay Station to Debsconeag; 3) Stone Dam Dryway from Stone Dam to Shad Pond; and, 4) Millinocket Stream between Millinocket Lake Storage Dam and Shad Pond.
(c) assess the frequency, timing, duration and predictability of optimal and acceptable paddling flows under current, proposed, and alternative modes of operation;
(d) identify the need for, and define adequate put-in and take-out points that promote car-top boating, and also identify the need for additional or improvements to parking areas;
(e) identify the location, challenge, and other recreational attributes associated with specific rapids and other river features;

(f) assess the flow information needs of whitewater boating and the current and potential flow information distribution system.

§5.9(b)(2)
Not applicable.

§5.9(b)(3)
Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, aesthetics, and other non-developmental values of the project, as well as power and developmental values. Any license issued shall be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. Conducting the necessary studies and implementing measures to ensure public access to outdoor recreation is in the public interest. It is widely accepted that outdoor recreation has significant benefits to participants including health, well-being, and quality-of-life. Outdoor recreation also has proven economic benefits for communities located near recreational resources. FERC has concluded elsewhere that *"to fully evaluate the project's effect on whitewater recreation opportunities and to balance potential enhancement opportunities with their cost, a controlled-flow whitewater boating study is relevant to the Commission's public interest determination."* The reaches between Ripogenus Dam and Shad Pond, including bypassed reaches and the riverine reach along Millinocket Stream offers recreational opportunities unique to the region provided that sufficient flow and access are provided.

*Background and Existing Information*
§5.9(b)(4)
Whitewater boating is currently an existing use on the West Branch of the Penobscot River and Millinocket Stream. American Whitewater's national whitewater river inventory identifies these river reaches on the West Branch of the Penobscot River and Millinocket Stream as providing high quality whitewater boating opportunities. The PAD contains little information on whitewater boating use or the extent to which the Licensee's peaking operations and flow diversions impact on the availability of sufficient flows for whitewater boating in the vicinity of each of the projects undergoing relicensing.

*Project Nexus*
§5.9(b)(5)
Project operations at the Ripogenus Hydroelectric Project and the Penobscot Mills Hydroelectric Project directly impact whitewater boating opportunity at each development by diverting natural river flows into penstocks and powerhouses, inundating upstream rapids with impoundments, and dewatering natural river features that would otherwise be available for whitewater boating. While these impacts are partially mitigated under current operations, alternative modes of operation would enhance whitewater boating opportunity in and near the projects.

*Study Methodology*
§5.9(b)(6)

The study we request that the licensee for the Ripogenus and Penobscot Mills hydroelectric projects conduct a controlled-flow whitewater boating study on each of the four identified river reaches – Ripogenus Dryway, McKay Station, Stone Dam Dryway, and Millinocket Stream – following the standard methodology as described in Whittaker, et. al. (2005). This methodology is designed to assess the presence, quality, and preferred flow ranges for river-based boating resources in a stepwise manner. The process steps are generally 1) desktop analyses, 2) on-land feasibility assessment, 3) on-water single flow assessment, 4) on-water multiple flow assessment. We expect and request the full implementation of this methodology. Because the quality of the resource has not been fully analyzed with current metrics, we request that on-water multiple flow assessments be conducted.

We recognize that there is considerable existing information that will inform the study process with respect to the McKay Station reach; however, there is little existing information known about the two bypassed reaches and Millinocket Stream. During the Level 1 study phase, the licensees should compile existing information from literature, conduct individual interviews with organizations and individuals familiar with each aspect of the four river reaches, perform a hydrological analysis of flows on the West Branch of the Penobscot River and Millinocket Stream and project operations, and analyze of project operations under current and alternative modes of operation. Following the Whittaker study protocols, the licensee, in coordination with recreation stakeholders, should conduct a Level 2 study on those sections of the river where insufficient information is known to identify minimum acceptable and optimal flow levels and provide demonstration flows to an expert panel to identify appropriate flow ranges. Should the Level 2 study be insufficient to provide information necessary to fully evaluate the whitewater boating potential of the reach at various flow levels, an on-water multiple flow evaluation Level 3 study should be conducted in accordance with the protocols.

We will work with the licensee to document the known information regarding the river. We will provide volunteers and technical support for the studies as appropriate. We hope to work collaboratively with the licensee on this study. The whitewater boating study methodology we have requested has been used on dozens of other FERC regulated reaches.

*Level of Effort and Cost*
§5.9(b)(7)
We are willing to work with the licensee on the whitewater paddling controlled-flow study to keep costs reasonable and the quality of information high. The information that is already known about the reach below McKay Station can jump-start the study process and avoid duplicate effort. The consultants usually employ still image and video documentation, surveys of the boaters, a guided conversation among the boaters, and subsequently a written report. Given the collaborative approach sought by the paddling community, including in-kind contributions of time and expertise, a consultant should be able to complete this study on behalf of the licensee for a very reasonable cost.

- **Study Request 3: Aesthetics Resources Study**

*Goals and Objectives*
§5.9(b)(1)

The goals of the Aesthetics Resources Study are to:

(a) Inventory and baseline aesthetic resource conditions (e.g. visual and auditory);
(b) Determine if the projects have an adverse effect on a scenic vista, riverscape, or other noteworthy natural feature;
(c) Determine if the project degrades the existing character or quality of public views of the site and its surroundings;
(d) Determine if the project contributes substantial light or glare which would adversely affect night-time views in the area.
(e) Determine what the ambient noise levels are generated by the various plant operations and other uses of project lands.

§5.9(b)(2)
Not applicable.

§5.9(b)(3)
Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, aesthetics, and other non-developmental values of the project, as well as power and developmental values. Any license issued shall be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. Recreation and aesthetics have been identified as a legitimate project purpose by the Commission.

*Background and Existing Information*
§5.9(b)(4)
Across both the Ripogenus and Penobscot Mills hydroelectric projects, no aesthetic mitigation flows, or visual screening is required notwithstanding the presence of spectacular gorges, waterfalls, and geologic features throughout the project boundaries and surrounding landscape. The minimum flow at the Ripogenus Dryway varies from 100 cfs during the summer down to 12 cfs for the rest of the year leaving only a trickle in the river along the Upper Gorge Trail while the lower gorge below McKay flows with 1800 + cfs throughout the year, which likely impacts the aesthetic values of this reach. In the Millinocket Development, the Stone Dam Dryway remains completely dewatered below the dam except for 2 to 5 cfs leakage from the dam or other small tributary inflow also likely impacting the aesthetic values of this reach. The licensee's operations resulting in the lack of any meaningful flow in the Stone Dam Dryway has eliminated the aesthetic views of what was once Grand Falls but is now not so grand. At the Millinocket Lake Storage Development, the steady state flow of 60 cfs into Millinocket not only eliminates the benefits of naturally variable flows that restore aquatic habitat, but also diminishes the aesthetic views of the river by boaters paddling the reach. We seek a study to assess improvements in visual resources that multiple flow choices can provide.

Visual impacts and natural vegetative screening should be evaluated to mitigate the unnatural development in that area. Minimization of visual intrusion associated with the vertical tailrace walls and blasted cliff faces can be accomplished by masonry, painting and other mechanisms to

disguise the unnatural features of this part of the development. We seek a study that will assess the characteristics and severity of these elements of the facilities and earth tone painting, vegetation plantings and physical modification options that will reduce the visual intrusion these elements of the facilities represent. Similarly, the lack of water flow over the impoundment dams degrades the visual aesthetics in the bypassed reaches. We seek a study to assess improvements in visual resources that multiple flow choices can provide.

*Project Nexus*
§5.9(b)(5)
Project operations at the Ripogenus Hydroelctric Project and the Penobscot Mills Hydroelectric Project directly impact the aesthetics of the surrounding landscape as experienced by visitors. The Katahdin Region is widely known for its natural, recreational, and aesthetic characteristics. The six dams and related hydropower projects cause significant impacts on the aesthetic values of the river corridor and surrounding landscape, through both the diversion of water into conduits and through the introduction of a significant number and size of man-made structures directly and indirectly related to project operations.

All the projects feature structures and landscape disturbances that are egregious man-made intrusions upon what were once unspoiled natural riverscape vistas. Examples include Upper Gorge Hiking Trail and Grand Falls as well as the tailwater structures and equipment atop the blasted notch into the once spectacular cliffs McKay Station, the study we seek will explore a full range of options to mitigate the degradation of the natural scenic vistas occasioned by the equipment, structures and landscape disturbance associated with each project.

*Study Methodology*
§5.9(b)(6)

An aesthetic resource study will evaluate the impacts of the project facilities to visually sensitive areas, resources, and residential areas. A study methodology may be designed based on the visual classification systems that have been developed by the federal Bureau of Land Management[1] and U.S. Forest Service[2] and by some states to rank the scenic quality of various landscapes. Using these standards may be appropriate to quantify the potential visual impact of project operations on a given scenic, natural, and/or recreation area. Visual impacts on areas such as historic districts, traditional cultural properties, and places listed on, or eligible for listing on, the NRHP should also be addressed by the study. For all designated or sensitive scenic areas, a study should describe mitigation proposed to reduce visual impact. Mitigation may include planting shrubs and small trees for visual screening; removing or restoring project facilities in disrepair; removing and implementing management plans related to debris and trash; evaluating the need for audible mitigation and light pollution mitigation as appropriate. Additional mitigation measures may be recommended such as painting the facility with colors that would harmonize with the landscape, building facades consistent with natural features or buildings in the area, or effectively restoring the landscape, including screening the facility with shrubs and trees. Part (e) of section 380.15 (siting and maintenance requirements) provides additional information about avoiding and minimizing impacts on visually sensitive resources.

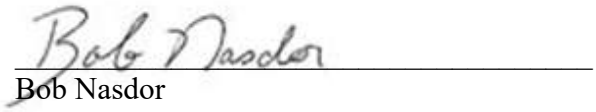
[1] https://www.blm.gov/programs/recreation/recreation-programs/visual-resource-management
[2] https://blmwyomingvisual.anl.gov/vr-inventory/usfs/

*Level of Effort and Cost*
§5.9(b)(7)
We are willing to work with the licensee on the aesthetic resource study to keep costs reasonable and the quality of information high. The information that is already known and documented can help serve as a baseline inventory, such as existing unused project facilities, project structures in disrepair, audible impacts, and aesthetic impacts of dewatered river reaches. Paddlers and our members will offer photographs, key person interviews, and may also suggest avoidance, minimization, and mitigation elements. Given the collaborative approach sought by the paddling community, including in-kind contributions of time and expertise, a consultant should be able to complete this study on behalf of the licensee for a very reasonable cost.

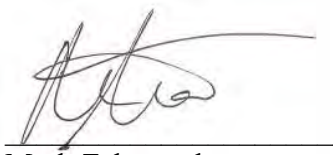
## Conclusion

We respectfully request that the licensees for the Ripogenus Hydroelectric Project and the Penobscot Mills Hydroelectric Project complete the above described (1) Recreation Facility Inventory, Recreation Use and Needs Assessment, Aesthetics and Reservoir Surface Area Assessment Study, (2) Controlled-flow Whitewater Boating and Access Study, and, (3) Aesthetic Resources Study, in order to provide FERC with sufficient information to complete its NEPA analysis of project impacts to determine appropriate license conditions that are protective of recreation values and mitigate project impacts. Thank you for considering these comments.

Respectfully submitted this 8th day of October, 2021



Bob Nasdor
Northeast Stewardship and Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776
(617)-584-4566
bob@americanwhitewater.org



Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
100 Illick's Mill Rd.
Bethlehem, PA 18017
(610)-868-6915
mzakutansky@outdoors.org

## CERTIFICATE OF SERVICE

I hereby certify that on this day I have caused to be served electronically a copy of the foregoing Comments and Study Requests of AW & AMC on all parties listed on the official service list compiled by FERC in this proceeding in accordance with the applicable FERC regulations.

Dated at 8, October, 2021



Mark Zakutansky

Beckham M Bayreuther, Caratunk, ME.
My name is Beckham Bayreuther. I am a young whitewater kayaker and fisherman, and I get to enjoy some of Maine's greatest outdoor experiences because of it. The Dryway on the West Branch of the Penobscot River is one of those many great Maine adventures that few people get to enjoy. I as well as many other Whitewater/fishing enthusiasts would like to request a flow study on the Dryway, Millinocket Stream, and the Backbend to determine navigable water levels for the purposes of recreational/commercial boating and to judge flow rates for increased fish habitat. The goal of the requested study is to have a better understanding of minimum/ideal flows for kayaking and rafting as well as fish habitats. This study should have the objective of obtaining a minimum CFS required for kayaking and rafting as well as to obtain the minimum CFS required for kayaking and rafting. These flows should both accommodate all experience levels of whitewater boating as well as increase fish habitat.
The Dryway section of the Penobscot is just above the commercial rafting put-in (McKay Station) and is a section of the river where the water has been diverted from Ripogenus Dam to Mckay Station. This section is a special section of whitewater that is seldomly run because of low water levels. By finding flows suitable for whitewater boating it would lengthen the class IV/V section of the Penobscot by almost 2 miles. The requested study would also create information on this section, in terms of difficulty and navigability
This study should be done by scheduling a day or days in which Brookfield Releases 300,500,1000,1500,2000,3000cfs out of Ripogenus Dam. This would allow for kayakers, rafters, and fishermen to assess the different flows to find a minimum and ideal flow. After there should be a meeting and survey conducted to organize results. This study should find flows that maintain downstream conditions.

Christopher Howe, kingfield, ME.
I Christopher Howe manage a raft company in Millinocket and have been a registered Maine Whitewater Guide for 13 years, and own a home in Kingfield, Maine.

I have enjoyed paddling the whitewater of Millinocket Stream on many occasions. probably around 20-30 times over the last 12 years from flow levels of 400cfs to about 1200cfs.

There are currently no scheduled releases from Millinocket Lake Dam.

The section of river I am referring is from Millinocket Lake Dam down to the snowmobile bridge just off the Staceyville road.

This section of whitewater currently only runs unscheduled in the spring, generally in May and sometimes later in the year with significant rainfall.

I have taken many friends and coworkers on Millinocket Stream to introduce them to whitewater kayaking and canoeing.

The rapids of Millinocket Stream, Class II create one of the best learning environments for whitewater boating I have ever seen. The rapids are small and short with nice long pools at the bottom.

Having any scheduled releases on Millinocket Stream will create a great introduction to whitewater for folks in the region. which is already a prevalent form of recreation in Millinocket with the West Branch of the Penobscot.

Having scheduled releases for the purpose of whitewater boating on Millinocket Stream can give the town of Millinocket yet another form of recreation to help draw people to the town as a place to live.

Having a scheduled release on Millinocket Stream could also open up the the possibility of holding a Canoe Race. Canoe races all over the state bring significant tourism and economic impact to the local region and draw people to visit the town. The venue of Millinocket Stream for a canoe race would be extraordinary and would easily rival the Kenduskeag Canoe Races and Soudabscook Canoe Races. A Millinocket Stream Canoe Race would significantly add to the the already vibrant canoe racing circuit in the state of Maine, and amongst racers the stream would become known for its consistent rapids.

Having scheduled releases from Millinocket Lake dam would offer a tremendous opportunity for Commercial Whitewater Rafting Outfitters to expand their trip offerings. Outfitters could run clients from the Millinocket Lake Dam in inflatable kayaks also known as Duckies. This can be a incredible experience and gateway to whitewater rafting clients to experience the river in their own craft under their own control. As a whitewater guide for 13 years, Kids and Families would absolutely love this trip if it were offered.

Local public schools currently use Millinocket Stream as part of a Outdoor Ed/Recreation program to get youth out on the river.

Currently they are limited to only paddling the very lower part of the stream because of low water conditions upstream were the river is unnavigable.

I request a flow study to assess river conditions downstream of Millinocket Lake Dam to determine minimal and ideal flow rates for the purpose of whitewater boating

Goals:
A) to find minimum and ideal flows for recreational rafting, kayaking, and canoeing.
B) To obtain data about minimum and ideal flows needed to increase fish habitat.

Objectives:
Determine any congruencies between recreational boating and increased fish habitat.
Obtain minimum CFS level required for kayak, canoe, and raft passage.
Obtain an ideal CFS level for kayak, canoe, and raft passage.
Obtain an ideal flow for increased fish habitat.

Methodology:
A)Schedule a day or days where Brookfield Releases 200, 300, 400, 500,1000cfs from Millinocket Lake Dam.
B) Schedule kayakers, rafters, canoers, and biologists to be available to assess all flows and water temperatures.
C) Have participants fill out surveys about observed river conditions.
E) Have a team compile the data and make a report to present to FERC on the flow study findings.

Anticipated Outcomes:
Find a flow that Brookfield, kayakers, canoer's, and fishermen can all agree on to make this extraordinary beginner whitewater run available to the public.

Conclusion:

I would like to see Several Scheduled releases through out the summer that could economically benefit the town by holding a Canoe Race, create additional income for rafting outfitters, provide the Katahdin Region youth with a great river to get into whitewater boating, and also bolstering the Katahdin Regions recreational benefits and offerings to help draw people to move to the town.

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426
October 8, 2021

OFFICE OF ENERGY PROJECTS

Project Nos. 2572-133 & 2458-247 – Maine
Ripogenus Hydroelectric Project
Penobscot Mills Hydroelectric Project
Great Lakes Hydro America, LLC

VIA FERC Service

Randall Dorman, Licensing Manager
Brookfield Renewable
150 Main Street
Lewiston, ME 04240

**Reference: Staff Comments on the Pre-Application Document and Preliminary Study Proposals for the Ripogenus Hydroelectric Project and the Penobscot Mills Hydroelectric Project**

Dear Mr. Dorman:

We have reviewed the Pre-Application Document (PAD) for the Ripogenus Hydroelectric Project No. 2572-133 (Ripogenus Project) and the Penobscot Mills Hydroelectric Project No. 2458-247 (Penobscot Mills Project), filed on June 11, 2021, and conducted scoping meetings and participated in the environmental site review for the projects on September 9, 2021.

Based on staff's review of the PAD, scoping meetings, and site review, we need additional information and clarification on the material presented in the PAD. Unless otherwise indicated in the specific request, the information requested (*see* attached Schedule A) should be filed with the proposed study plan on, or before, November 23, 2021. If the requested information is not readily available, the proposed study plan should discuss Great Lakes Hydro America, LLC's plans for gathering the information prior to filing the final license application. In addition, if the requested information causes another part of the PAD to be inaccurate, that part must be revised and provided as well. Please be aware that further requests for additional information may be sent to you at any time before the Commission takes final action on your application. We also provide comments on the preliminary study proposals in Schedule B.

If you have any questions, please contact Allan Creamer at (202) 502-8365, or allan.creamer@ferc.gov.

Sincerely,

Stephen Bowler

Stephen Bowler, Chief
South Branch
Division of Hydropower Licensing

Attachments: Schedule A
Schedule B

**SCHEDULE A**
**ADDITIONAL INFORMATION REQUESTS**

*General*

1. The Preliminary Application Document (PAD) provides a summary of the studies performed during the previous relicensing. During the September 9, 2021, scoping meetings, stakeholders expressed concern regarding access to reports and information. On September 24, 2021, Great Lakes Hydro America, LLC (GLHA) filed the 1991 license applications for the Ripogenus Hydroelectric Project No. 2572-133 (Ripogenus Project) and the Penobscot Mills Hydroelectric Project No. 2458-247 (Penobscot Mills Project), along with supporting study reports and post-license monitoring reports. However, there are additional references in the PAD that were not included in GLHA's September 24 filing. Please include with the Proposed Study Plan (PSP) copies of the following documents/information:

    (a) Maine Rivers Fish Assemblage Assessment: Interim Report, Assessment: Interim Report II Penobscot River & Tributaries: 2004. (Yoder *et. al*, 2008);
    (b) Maine Rivers Fish Assemblage Assessment: Interim Report II (Midwest Biodiversity Institute & Center for Applied Bioassessment and Criteria (MBI), 2005);
    (c) MDIFW unpublished sampling data from 2017 and 2018, as cited in a footnote on p. 5-122;
    (d) Swartz (2007), as referenced on page 5-134 of the PAD;
    (e) Recreational Activities in the Ripogenus Project Survey, as referenced on page 5-213 of the PAD; and
    (f) Shoreline Buffer Zone Management Plans, including any amendments to the plans, for the Ripogenus Project and Penobscot Mills Project.

*Project Description*

2. The PAD, in sections 4.3.1, *Ripogenus Project*, and 4.3.2, *Penobscot Mills Project*, describes the steel trash rack structures at the Millinocket Lake Storage Development's pumping station and at the projects' powerhouse intakes. The PAD indicates that the trash racks have clear bar spacings varying from 1 inch to 2-7/8 inches. No other design specifications are provided. To assist us in our review of potential fish entrainment and impingement at the projects, please include in the license application: (a) the overall dimensions (including bar spacing) of each trash rack panel protecting the project intakes; and (b) estimates of the approach velocity and through-the-rack velocity for the trash racks, along with the calculations and/or methods used to develop the estimates. This information is required by sections 4.51(b)(1) and 5.18(a)(5)(iii) of the Commission's application regulations. If any of

this information is not available, such information should be obtained as part of GLHA's proposed studies.

3. The Penobscot Mills Project was originally licensed in 1996 with 70.6 MW of installed capacity. The PAD, in section 4.3.2, *Penobscot Mills Project*, states the authorized installed capacity is 67.875 MW. Please account for the lower installed capacity reported in the PAD, which may be due to inoperable turbines at the Millinocket Development. For any turbines which are inoperable, please describe when the turbines were shut down, and the necessary repairs needed to refurbish the turbines. Your application should also include a summary of modifications to any of the project turbines which have occurred since filing of the March 31, 2000 Exhibit A, which describes the project facilities.

   Exhibit A, filed on March 31, 2000, identifies a 5-mile-long transmission line extending from the 40 hertz (Hz) Dolby substation to the 40 Hz Substation No. 1 located at the Millinocket Mill. Your comments on Scoping Document 1, filed October 5, 2021, state that this transmission line is currently out of service. Please describe when and why this line was shut down, and the status of plans to return this line to service. Your application should also include a summary of any modifications to any of the project transmission lines which have occurred since filing of the March 31, 2000 Exhibit A, which describes the project facilities.

*Project Operation*

4. Tables 4.3-1, 4.3-4, 4.3-6, 4.3-8, and 4.3-10 of the PAD provide the hydraulic capacities (in cubic feet per second or cfs) for the turbines associated with the Ripogenus and Penobscot Mills Projects. It is not clear if the hydraulic capacity provided is rated capacity or some other capacity (e.g., minimum, or maximum hydraulic capacity). To clarify the hydraulic capacities shown in the tables and the operating capabilities of the project's units, please revise the tables to include the minimum, rated, and maximum hydraulic capacities of each unit and file the revised tables with the PSP.

5. Section 4.4, *Project Operations*, of the PAD indicates that the Ripogenus and Penobscot Mills Projects are operating as a combined system. Specifically, the PAD states that the Ripogenus Project and two developments associated with the Penobscot Mills Project (Millinocket Lake Storage Development and North Twin Development) are operated as storage and release facilities. Three other developments associated with the Penobscot Mills Project (i.e., Millinocket, Dolby, and East Millinocket) are operated in a run-of-river mode (or run-of-release). During the September 9, 2021 daytime scoping meeting, NMFS representatives characterized the operations of the two developments as daily peaking.

Detailed operations data is needed to clarify how the projects are operated on a daily basis. Therefore, please include, as an appendix to the Proposed Study Plan, 10 years of operations data (in excel format) for each project, or each individual development, in the case of the Penobscot Mills Project, including: (1) daily impoundment elevations; and (2) daily outflows (minimum, maximum, and average discharges). The data for each project/development should be presented in separate tabs of the excel spreadsheet. In addition, in order to characterize any changes in the hydrologic conditions in the West Branch, please provide, in the license application, the average annual flow at the Penobscot Mills Project for the period of record of 1970 through present.

*Water Resources and Water Quality*

6. Section 5.3.4, *Existing and Proposed Uses of Project Waters*, of the PAD refers to a Water Use Plan that was developed during the prior relicensing based on prioritized water uses and operations modeling. This Water Use Plan was used as the basis for the operational requirements included in the projects' 1996 licenses. To assist us in reviewing the water management issues at the two projects, please provide: (1) a copy of the current Water Use Plan, including any amendments made to the original plan; and (2) all of the 10-year reports documenting the effectiveness of the Water Use Plan, as required by Article 403 of the 1996 Ripogenus Project license.

7. The Water Use Plan described above was based on a Water Use Model developed in 1996 to evaluate various flow proposals. If you plan on using this Water Use Model to support your licensing proposal, please provide: (1) any report documenting the model development and the results of any modeling done to support development of the Water Use Plan; and (2) a quantitative analysis showing the hydrology in the project area has not changed since 1996 when the model was developed. This analysis may be accomplished by comparing hydrographs for the project area. The Water Use Model used a hydrologic record and developed flow duration curves for a 15-year period between 1976 and 1990. Similar information can be prepared and analyzed for the most recent 15-year period.

8. Appendix D of the PAD provides monthly and annual flow duration curves for the outflows at the Ripogenus and Penobscot Mills Projects for the period 2016 through 2020. So that we may accurately read the numbers defining the curve, in addition to the curves, please provide this information in tabular format in a Microsoft Excel file.

*Fisheries and Aquatic Resources*

9. Section 4.3.1, *Existing Project Facilities-Ripogenus Project*, of the PAD (on page 4-14), states that the invert elevation of the Ripogenus Project intake is 898.09 feet "USGS datum," which is 43.5 feet below the normal full-pool elevation of the Ripogenus impoundment. To assist us in reviewing water quality issues in the West Branch of the Penobscot River downstream from Ripogenus Dam, please describe: (1) the relationship between the intake's invert elevation and the typical depth at which thermal and dissolved oxygen (DO) stratification occurs in the Ripogenus impoundment; (2) the quality of water (i.e., DO and water temperature) discharged from McKay Station; and (3) the mechanism and point of release for water released from Ripogenus Dam to the Upper Gorge. If any of this information is not available, such information should be obtained as part of the PSP.

*Wildlife, Botanical Resources, and Threatened and Endangered Species*

10. Section 5.6(d)(3)(vi) of the Commission's regulations require that the PAD include estimates of acreage for each type of wetland, riparian, and littoral habitat, including variability in such availability as a function of storage at a project that is not operated in a run-of-river mode. We need this information to assess the potential impacts of project-related water level fluctuations on wetlands, littoral and riparian vegetation, and wildlife. In the PAD, wetland habitats in the vicinity of the projects are presented in figure 5.6-1 through figure 5.6-6, and table 5.6-1 includes a summary of wetland habitats occurring within the approximate boundaries of the projects. However, the PAD does not discuss the variability in these habitats associated with project operation. Thus, if available, please include in the license application, estimated variability (in acres) of each type of wetland, riparian, and littoral habitat as a function of storage at the projects. If this information is not currently available, please include collection of the data as part of your PSP.

11. Figures 5.6-1 (sheets 8 through 10) and 5.6-5 in the PAD include maps of the Ripogenus Project and Penobscot Mills Project transmission line corridors. To assist in our review of potential effects of transmission corridor maintenance on wetlands, please provide, in the license application, a breakdown of the wetland acreage provided in table 5.6-1 that includes the acreages by the wetland types occurring in the transmission line corridors for each project. Also, the wetland maps of the transmission line corridors are difficult to review due to the small scale (e.g., sheets 8 through 10 in Figure 5.6.1). When filing your license application, please provide larger scale wetland maps of the transmission line corridors at the projects that include wetlands in the vicinity of the corridor as well as those directly within the corridor.

12. Table 5.5-3 in the PAD provides a list of numeric identifiers and quality rankings of mapped inland waterfowl and wading bird habitats that are located within the approximate boundaries of the projects. However, no maps were provided. To facilitate our review of the potential effects of the projects on waterfowl and wading bird habitats, please include in the license application a map, or maps, indicating the location of these areas relative to the project boundaries, and include the acreage associated with each type of habitat in tabular format.

13. The license application is required to include information regarding the potential effects of the current and proposed project operation, maintenance, and project-related recreation on project resources, including botanical and wildlife resources; wetlands, riparian, and littoral habitat; and rare, threatened, and endangered species and habitats (*see* sections 5.16(b)(3) and 5.18(b)(5)(ii)(B)). Commission staff also intend to evaluate any Endangered Species Act candidate species potentially occurring in the project areas. As noted on page 5-197 of the PAD, in table 5.7-1, and Appendix F, the project areas include diverse upland and wetland habitat associated with the shoreline of the West Branch, and the shorelines of the impoundments within the project boundaries. Additionally, there are about 36 miles of transmission line corridors within the project boundaries. Therefore, with the license application, please include an evaluation of the projects' effects on the aforementioned environmental resources. Also, to assist staff in assessing the potential occurrence of federally-listed species or candidate species within the vicinity of the projects, please file the U.S. Fish and Wildlife Service Information for Planning and Consultation (iPaC) database reports referenced in the PAD, and the GIS data layers for the project boundaries used to generate the iPaC reports.

14. The PAD, in Figure 5.5-1, depicts a map of the Back Channel showing the Wildlife Management Area (WMA) and associated enhancements. The WMA comprises about 2,300 acres of land adjacent to the Back Channel downstream from Stone Dam and Quakish Lake. To facilitate our analysis of potential project effects on the resources of the WMA, please provide a breakdown of the following in the license application: (1) wetland types and acreage for each of the management blocks illustrated in figure 5.5-1; (2) the total acreage for each of the management blocks; (3) a description of the forest type, dates, and acreage of the timber harvest completed in Management Block 3, and (4) a description of the forest type, estimated dates, and acreage of the timber harvest proposed in Management Block 4. Please also include a revised figure 5.5.1 with the National Wetlands Inventory (NWI) wetlands shown in figure 5.6.4 of the PAD.

*Recreation and Land Use*

15. The PAD, in section 5.8.2, *Existing Project Recreation Facilities and Opportunities*, indicates that there are six project recreation facilities at the Ripogenus Project: Caribou Lake Put-In, Chesuncook Dam Point Boat Launch, Chesuncook Lake Remote Campsites, Umbazooksus Stream Campsites, Upper Gorge Trail, and McKay Station Rafting Put-In Site. The same section of the PAD lists six project recreation boat launch facilities at the Penobscot Mills Project: Millinocket Lake, Ambajejus Lake, South Twin Lake (Partridge Cove), Green Bridge, Dead Man's Curve, and Dolby Pond (Flowage). No schematic drawings (only photographs) were included for the facilities. To facilitate our review of recreation resources at the projects, please include in the license application a map or drawing of each facility showing all amenities to scale, including parking areas, in relation to the project boundary.

16. The PAD, in section 5.8, *Recreation and Land Management*, lists several non-project recreation facilities at the Ripogenus and Penobscot Mills Projects that are located within the project boundaries. To facilitate our review of all the existing recreation facilities at the projects, please identify these facilities on a map (or maps) with respect to the project boundaries and include the map(s) with the license application.

# SCHEDULE B
# COMMENTS ON PRELIMINARY STUDY PROPOSAL

## PRELIMINARY STUDY PROPOSAL COMMENTS

*General*

1. In section 6.2, *Proposed Studies and Information Gathering Associated with Identified Issues*, of the Preliminary Application Document (PAD), Great Lakes Hydro America, LLC (GLHA) states that a significant body of information exists for the Ripogenus Hydroelectric Project No. 2572-133 (Ripogenus Project) and the Penobscot Mills Hydroelectric Project No. 2458-247 (Penobscot Mills Project). GLHA maintains that a full suite of new studies is not needed and that the information on which the existing licenses are based is sound and should be relied upon in these relicensing proceedings. However, many of the referenced studies are 30 years old and may not reflect current conditions. To ensure that the current relicensing of the two projects is based on current information, GLHA should demonstrate, with supporting information, that the results of the past studies remain valid today.

*Water Quality*

2. During the September 9, 2021, daytime scoping meeting, questions were raised regarding what information is available to describe the water temperature released from Ripogenus Dam and McKay Station and the effect of those temperatures on the West Branch of the Penobscot River downstream from the project. It is not clear from GLHA's response what, if any, data exists to address this question. In order for us to evaluate the temperature effects associated with water released from the Ripogenus Project, please ensure that your proposed Water Quality Study Plan includes methodologies to collect information in sufficient detail to: (a) accurately describe existing water temperature and dissolved oxygen in the Upper Gorge and the West Branch of the Penobscot River downstream from McKay Station; and (b) assess potential project-related effects on water quality in the river.

*Recreation and Land Use*

3. In section 6.0 of the PAD, the proposal for recreation facility inventories states that Great Lakes Hydro will inventory and describe the project recreation facilities and amenities. During the scoping meeting, and in submitted comments, concerns were raised about access to recreation facilities under low water conditions. Additionally, in section 5.10 of the PAD, erosion issues at recreation facilities were discussed. To facilitate our review of the status of recreation access, please include in an inventory

of the general condition of the project recreation facilities, and documentation of any specific erosion issues or low-water use limitations affecting recreation at the facilities.

Additionally, section 6.0 states that updated recreation plans will be included as part of the license application. Please ensure that maintenance procedures for the facilities are included in the plans.

Jacob Risch, MADISON, NH.
To Whom it may concern,

My name is Jake Risch, I am a co-owner of the Sawyer River Group, LLC a swiftwater rescue training company that teaches courses on the West Branch of the Penobscot River and a founding member and Vice President of the non-profit White Mountain Swiftwater Rescue Team in New Hampshire. I grew up canoeing on the lakes and rivers of the North Maine Woods and have been paddling Class V whitewater for more than 20 years. I have been a registered Maine Whitewater Rafting Guide and have explored rivers in 15 countries on four continents, including a 7-week expedition from the source of the Amazon in Peru, first descents in Turkey and Indonesia and expeditions to the remote corners of the Himalaya in Nepal. Through the Sawyer River Group, my business partner and I have imparted safety and rescue skills to hundreds of river users and first responders in Maine and New Hampshire.

Additionally, I am an event organizer. I am the race director for the Tuckerman Inferno Penthathalon adventure race on Mount Washington and the Smalls to the Wall kayak steep creek race on the Sandy River in Sandy River Plantation, Maine. I organize safety for the Maine Whitewater Championships on the Kennebec and West Branch of the Penobscot. I have paddled the Rippogenous Gorge dryway section at numerous flows from 500 cfs up through 5,000 cfs.

The dewatered section of the Rippogenous Gorge between Rippogenous Dam and McCay Station (or “dryway”) is a World Class whitewater run. This run provides a “Big Water” experience comparable to rivers in the Himalayas, Andes, and the Rockies. A scheduled release through the dryway would attract whitewater paddlers from around the northeast and eastern Canada. A dryway release would be an event around which a whitewater festival similar to the festivals on the Moose and Beaver (in upstate NY), Deerfield (in Western Mass), and Gauley (in West Virginia) rivers could be organized bringing significant economic stimulus to the Millinocket region. The run from the Rippogenous Dam through the dryway combined with the existing Rippogenous Gorge to Cribworks section ending at Big Eddy would be the premier scheduled Class IV/V run in New England and provide ample incentive for whitewater enthusiasts to make the trek to northern Maine.

From a difficulty/navigability standpoint, I would consider the run a Class IV or V run depending on the flow and no more difficult than other regularly and commercially-run dam release rivers around the country.

There is safe access to the section using an anglers trail on river left departing from the parking on the north side of Rippogenous Dam.

I formally request a flow study to determine the optimal flow to provide recreational opportunities for the widest range of whitewater paddlers and validate the feasibility of access on the river left bank.

Thank you for your consideration.
Jake Risch

Miles Puleio, Saco, ME.
My name is Miles Puleio. I have lived, worked, and recreated on the West Branch of the Penobscot River since 2011. I am a Class V kayaker and have paddled the Mckay to Big Eddy section thousands of times. I am also a fly fisherman and on average I fish 50 plus days a year on the Penobscot River.

Over these years the flows released have been drastically different. The flow changes I have witnessed on a day to day basis are fluctuating and inconsistent. A digital online gauge to find the hourly flow data would be a huge help for most recreational users. Fly fisherman and guides trying to drift the section of river below the Big Eddy to the above Big A find the takeout difficult to manage at a flow below 1700 CFS.

Peaking water flows not only effect users but more importantly the vital aquatic life in the river. Smelt are no longer abundant in this section of river, once years ago I am told by "old timers" the river was so filled with them, the shore of the river would have hundreds washed up. Now we see none washed up on the banks. The Caddis hatches are less abundant. Now maybe seeing only a few evenings during a season when Caddis cloud the sky. It is our responsibility to ensure this waterway be properly managed with the food source of the fish as top concern.
The average size salmon in my experience is no longer a 18"-20" fish. Fisherman are now reporting average fish at 12 - 14" inch salmon. A trophy fish is now the 18-20" range.

The Upper gorge Dryway section of river is an incredible stretch of whitewater. A release on the dryway section would be a huge recreational draw. A scheduled release on the dryway could lead to the next greatest river festival event happening in the Northeast. This could help to stimulate the local economy. Releasing cold water from deep gates could help cool the temperature of the river, creating a more inhabitable temperature for the fish. When the Dry way is running a certain flow and Mckay station is producing power at a certain flow a recreational play feature is created just up stream of the Hydro station at the bottom of the Dry Way. This wave is referred to in the kayaking community as the "wave that never was" due to its creation only occurring at very specific correlation of these two flows. It is my request that a flow study be done to determine what this ideal flow is to create this world class feature.
Thank you for the opportunity to comment.

Miles Puleio

Michael Smith, Millinocket, ME.
As a recreational paddler and professional outdoor educator living in Maine's Katahdin Region, I regularly paddle on the "Dryway" of West Branch of the Penobscot, as well as Millinocket Stream. The reaches in question in the Ripogenus Hydrologic Project (P-2572) and Penobscot Mills Project (P-2458) are exceptional in their natural beauty and recreation potential. As a member of American Whitewater, I am in concurrence with their comments and study request for these projects.

In particular I want to emphasize the need to further study flows on Millinocket Stream between Millinocket Lake and Shad Pond. This reach has the potential to serve as an incredible educational and recreational asset to the community and economy of Millinocket, and is a critical component in maintaining local fish and wildlife habitat. It's imperative that we study flows on this section so as to better manage water for recreational and environmental benefit.

Thank you for the opportunity to comment.

**Filed via "eFiling"**

October 8, 2021

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Division
888 First Street, N.E.
Washington, D.C. 20426

**RE: Comment on PAD and Study Requests, Ripogenus Project (FERC No. 2572) and Penobscot Mills Project (FERC No. 2458)**

Dear Secretary Bose,

On June 11, 2021, Great Lakes Hydro America, LLC (GLHA), a subsidiary of Brookfield Renewable, submitted Notices of Intent (NOIs) to file an application for new licenses and a Pre-Application Document (PAD) for the Ripogenus Hydroelectric Project (FERC No. 2572) and the Penobscot Mills Hydroelectric Project (FERC No. 2458)(the Projects). Subsequently, FERC issued its Notice of Intent to File License Applications, Filing of Pre-Application Document, Commencement of Pre-Filing Process, and Scoping; Request for Comments on the PAD and Scoping Document, and Identification of Issues and Associated Study Requests for the Projects on August 10, 2021. The Projects are located on the West Branch of the Penobscot River and on Millinocket Stream in Piscataquis and Penobscot Counties, Maine.

The Bureau of Parks and Lands (BPL) is a division of the Maine Department of Agriculture, Conservation and Forestry (MDACF), a cabinet level agency of the State of Maine. As authorized under Section 10 of the Federal Power Act, BPL reviews hydropower projects and provides recommendation to licensees with a focus on the adequacy of existing public recreation facilities and access to meet public needs, the adequacy of flow releases to provide for downstream boating opportunities, and the effect, if any, on public lands and private lands if available for public recreation.

Based on these responsibilities we have prepared the following comments on the PAD and Study Requests:

**PAD Section 5.8: Recreation and Land Management**

5.8.2.1 Ripogenus Project, Project Recreation Sites

Project recreation sites are defined on page 5-205 as "those that have been approved by FERC, are located within the Project boundary, and are managed pursuant to the FERC license". Table 5.8-1 on page 5-206 includes "10 campsites at various locations around Chesuncook Lake" and "managed by Penobscot River Corridor" (PRC) among the Project recreation sites listed, but does not mention Gero Island specifically. The text on page 5-210 describing the Project recreation sites includes "10 remote campsites on Chesuncook Lake...located around Chesuncook Lake and on Gero Island…managed by the PRC."

BPL Comments

There are 14 campsites on Chesuncook Lake managed by the PRC; four of the sites are on Gero Island, as shown on Figure 5.8-1 (a reproduction of a regional map produced by BPL). Based on the Project boundary as shown on Figure 4.2-2 and the Exhibit G drawing provided in Appendix C, it appears that at least one of the Gero Island campsites (campsite #4, a group tent site) and possibly another site (campsite #3, a lean-to site) may be within Recreation Area No. 1, shown on both of those sources, and therefore within the Project boundary. However, precise boundary coordinates for Recreation Area No. 1 are not provided, so we are not able to confirm this. The following latitude/longitude coordinates are provided for reference:

| Site | Lat. | Long. |
|---|---|---|
| Campsite 3 | 46.060743 | -69.388105 |
| Campsite 4 | 46.055033 | -69.379735 |

If one or both of these campsites are indeed within the Project boundary, they should be added to the list of FERC-approved Project recreation sites and treated as such in the Integrated Licensing Process (ILP).

Relatedly, it should be made more evident in the ILP that Recreation Areas No. 1, 2 and 3 as shown on Figure 4.2-2 and the Exhibit G drawing are within the Project boundary. These areas are not mentioned in the PAD until section 5.8.7 Existing Shoreline Buffer Zones within the Project Boundary, where on page 5-242 they are described as reserved for potential future recreation use but currently undeveloped. As noted above, Recreation Area No. 1 may have at least one PRC campsite and, if so, cannot be accurately characterized as undeveloped.

As a final point of clarification, the 10 Chesuncook Lake Remote Campsites managed by PRC, as listed in Table 5.8-1, includes five locations with one tent site each as well as four locations with two or three tent sites each and one location with two group tent sites; in total, these locations provide 16 individual and group tent sites. The four Gero Island campsites include a tent and lean-to site (2 total), a tent site, a lean-to site, and a group tent site (five sites in total). All of these are depicted on Figure 5.8-1.

5.8.2.1 Ripogenus Project, Project Recreation Sites

The 2008 Recreation Facility Report for the Ripogenus and Penobscot Mills Projects (GLHA 2009, as referenced in the PAD) submitted to FERC lists the Caribou Lake facility as an informal boat launch and Umbazooksus Stream as a public boat launch. (The recreation facilities table in

the above report was reproduced from the Final Environmental Statement prepared by FERC for the previous relicensing of the Projects (FERC 1996, as referenced in the PAD)). However, Table 5.8-1 on page 5-206 lists Caribou Lake Put-in as a formal FERC-approved recreation site. The boat launch at Umbazooksus Stream (paired with the Umbazooksus Stream West campsite, as shown on Figure 5.8-1) is not listed, nor is it included on Figure 5.8-3 depicting FERC-approved Project recreation sites at the Ripogenus Project.

BPL Comments
The Bureau requests clarification as to the status of the Caribou Lake Put-in, and that the Umbazooksus Stream boat launch be added to the FERC-approved recreation sites for the ILP, or an explanation why this should not be done.

5.8.2.1 Ripogenus Project, Non-project Recreation Sites
On page 5-214, the document describes Gero Island as "a non-project 3,000-acre island."

BPL Comments
As we have stated above, based on the Project boundary as shown on Figure 4.2-2 and the Exhibit G drawing provided in Appendix C, Recreation Area No. 1 on Gero Island, shown on both of those sources, is within the Project boundary. Therefore, it is inaccurate to describe the entire island as non-project. Also, we wish to again note the non-project campsites on Gero Island managed by the PRC (the number of which are project/non-project to be determined, as requested above), which are not mentioned in this section of the PAD. Lastly, based on BPL data, Gero Island is 3,180 acres in area.

5.8.2.2 Penobscot Mills Project, Project Recreation Sites
The 2008 Recreation Facility Report for the Ripogenus and Penobscot Mills Projects (GLHA 2009, as referenced in the PAD) submitted to FERC lists the Millinocket Dam facility as a public boat launch. (The recreation facilities table in the above report was reproduced from the Final Environmental Statement prepared by FERC for the previous relicensing of the Projects (FERC 1996, as referenced in the PAD)). However, Table 5.8-3 on page 5-215 does not include Millinocket Dam boat launch, nor is it included on Figure 5.8-4 depicting FERC-approved Project recreation sites at the Penobscot Mills Project.

BPL Comments
The Bureau requests clarification as to the status of the Millinocket Dam boat launch, and that the facility be added to the FERC-approved recreation sites for the ILP if appropriate, or an explanation why this should not be done.

5.8.7.1 Ripogenus Project, Existing Shoreline Buffer Zones within the Project Boundary
On pages 5-239 and 240, the document describes "the 200-foot Shoreline Buffer Zone (within the Project boundary)" and this zone is stated to exclude "campsites that are currently managed by the PRC."

Also, on page 5-240 the document states "a renewable conservation easement with the State of Maine was also established on Licensee-owned shoreline lands within 250 feet of the normal full pond elevation of Chesuncook and Ripogenus Lakes and Brandy and Black Ponds" and that

"certain campsite areas leased by the State of Maine *excluded from the Project boundary* (italics added) are included within the easement."

BPL Comments
These statements are confusing, in that all 10 of the PRC-managed campsites on Chesuncook Lake (for the present purposes, excluding the Gero Island campsites discussed above) are listed previously in the PAD as FERC-approved Project recreation sites, and are therefore within the Project boundary. This appears to contradict the exclusion of existing leased lands, including the campsites, from the 200-foot extension of the Project boundary on then-Great Northern Paper owned lands (the Shoreline Buffer Zone) as a condition of the 1996 license. BPL requests clarification regarding the 10 Chesuncook Lake campsites and the Project boundary.

The original renewable conservation easement described (Conservation Easement for Limited Duration) was executed June 7, 2002, as recorded in the Piscataquis County Registry of Deeds in Book 1393, Page 112; as amended in Book 1401, Page 191. This easement was made permanent with a Conservation Easement executed May 8, 2009, as recorded in the Piscataquis County Registry of Deeds in Book 1990, Page 149.

**Study Request, Project #2572 – Assessment of Boat Access to Chesuncook Lake with Pool Drawdown**

This study request relates to the evaluation of the existing Chesuncook Lake boat launches at Chesuncook Dam Point and Caribou Lake. As described in the PAD, the Chesuncook Dam Point facility is a single-lane gravel boat launch and the Caribou Lake facility is a primitive gravel put in.

*Criterion (1) – Describe the goals and objectives of each study proposal and the information to be obtained.*

1. The goal of this study is to evaluate the function of the Chesuncook Dam Point and Caribou Lake boat launches, thereby determining whether adequate trailered boat access is available to Chesuncook Lake through the boating season. The objectives of this study are to (a) evaluate the existing physical characteristics of the ramps (length, slope, water depth, condition) that affect the function and usability of the ramps at various pool elevations; and (b) evaluate how those characteristics and possibly other physical and environmental factors affect the ability of the public to access the waters of the lake, particularly as the annual pool drawdown proceeds.

*Criterion (2) – If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

2. The study is requested to ensure that the public has trailered boat access to Chesuncook Lake throughout the ice-free time of year (generally May – November). Ensuring public boating access to the waters of the State is an important resource management goal of the Bureau. The Bureau's Boating Facilities Program has a primary role in meeting this goal.

*Criterion (3) – if the requester is not a resource agency, explain any relevant public interest considerations in regards to the proposed study.*

3. The Bureau of Parks and Lands is a resource agency; specifically, a division of the Department of Agriculture, Conservation and Forestry, a cabinet level agency of the State of Maine.

*Criterion (4) – Describe existing information concerning the subject of the study proposal, and the need for additional information.*

4. To the best of our knowledge, there is limited information available on the current physical characteristics of the boat launches (such as slope, water depth at the bottom of the launch, condition of the launch below full pond) or on functionality at all relevant pool levels. The Bureau has received complaints from the public about the function of the Chesuncook Dam Point facility at certain times of year due to low water levels impeding access to the lake. Access to the lake by BPL Penobscot River Corridor staff for management purposes is also impeded.

*Criterion (5) - Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

5. The annual cycle of reservoir draw-down and refilling associated with project operations has the potential to have a direct effect on the usability of boat launch facilities. The circumstance of the reservoir elevation falling below the level at which a facility was designed to function is of particular concern. The Project Operations section of the PAD (Section 4.4) describes annual changes in Chesuncook Lake elevation; this includes a 28-foot targeted seasonal drawdown range (between el. 941.6 and el. 913.6), and a maximum drawdown of 44 feet based on operational limitations of the Project. No specific date is given for the 28-foot targeted drawdown. Notably, there is no FERC-mandated minimum pool level for the lake for any time of the year.

The Bureau does not have access to and the PAD does not provide historical elevation data for Chesuncook Lake. Therefore, we are not able to characterize the adverse effect of annual drawdown on boat access with more specificity regarding lake elevation at particular times of the year. However, field staff report that access was severely impeded by mid to late summer during both 2020 and 2021, with the shoreline some distance from the end of the launches, when drought conditions prevailed in the watershed. The photos below are offered as evidence of recent conditions.



Photo 1: Chesuncook Dam Point Boat Launch, Aug. 2021 (photo taken from just above the high water line)



Photo 2: Caribou Lake Boat Launch, Aug. 2021 (photo taken from approximate high water line)

The Bureau's consideration of this issue would be greatly facilitated by daily average surface elevation data for Chesuncook Lake for each of the past 10 years, as well as annual water surface elevation curves for the same time period. The study results, which should incorporate this lake elevation data, will help the Bureau determine whether to request that the license include a requirement to improve the boat launches to function at lower lake levels, to ensure that the public has trailered boat access at all desired pool levels. Alternatively, the Bureau may request that the license include a required minimum elevation to be maintained at Chesuncook Lake through Labor Day weekend each year to ensure public boat access is available throughout the prime summer boating season, with a lower minimum to adjust for low inflows to the impoundment due to dry hydrologic conditions in the watershed.

*Criterion (6) – Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

6. The Licensee has proposed a Recreation Facility Inventory and Condition Assessment Study. It is our request that the proposed study evaluate the functionality as well as the condition of the boat launch facilities. This study request proposes that standard engineering and design methodology and criteria for such facilities be applied in the evaluation, to include all relevant physical dimensions of the launches (e.g., length, slope, water depth, condition), and that the study document the range of surface elevations at which the launches are fully functional. ADA compliance should also be addressed in the assessment.

If these data are not available from existing as-built drawings, we request that measurements be obtained in the field. It may be advantageous to obtain data when the pool level is at or near the annual minimum; however, the measurements could be conducted at any pool elevation (i.e.,

when a portion of the ramps may be submerged), with the proper equipment and preparation. The evaluation should include all pool levels that are normally present throughout the period of the year when the lake is ice-free in order to fully determine the adequacy of the facilities.

*Criterion (7) – Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

7. The level of effort and cost is commensurate with a project the size of the Ripogenus Project and the likely license term. On-site measurement and other evaluation of the launch ramps will likely be needed to assess the function and condition of the ramps at various surface elevations. It is not expected that this on-site work, if necessary, would require more than a single day.

**Study Request, Project #2458 – Assessment of Boat Access to North Twin Impoundment (Ambajejus and South Twin Lakes) and Millinocket Lake with Pool Drawdowns**

This study request relates to the evaluation of the existing Ambajejus Lake, South Twin Lake and Millinocket Lake boat launches at Ambajejus, South Twin and Millinocket Lakes. As described in the PAD, the listed facilities are single-lane paved and gravel boat launches.

*Criterion (1) – Describe the goals and objectives of each study proposal and the information to be obtained.*

1. The goal of this study is to evaluate the function of the three Project boat launches listed above, thereby determining whether adequate trailered boat access is available to the lakes they serve through the boating season. (Project boat launches on Dolby Pond and on the West Branch below North Twin Dam are not included because the developments of which they are a part are operated in run-of-river mode, with little fluctuation in impoundment elevation.) The objectives of this study are to (a) evaluate the existing physical characteristics of the ramps (length, slope, water depth, condition) that affect the function and usability of the ramps at various pool elevations; and (b) evaluate how those characteristics and possibly other physical and environmental factors affect the ability of the public to access the waters of the lakes, particularly as the annual pool drawdown proceeds in Ambajejus and South Twin Lakes (North Twin Development).

*Criterion (2) – If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

2. The study is requested to ensure that the public has trailered boat access to the Project waters throughout the ice-free time of year (generally May – November). Ensuring public boating access to the waters of the State is an important resource management goal of the Bureau. The Bureau's Boating Facilities Program has a primary role in meeting this goal.

*Criterion (3) – if the requester is not a resource agency, explain any relevant public interest considerations in regards to the proposed study.*

3. The Bureau of Parks and Lands is a resource agency; specifically, a division of the Department of Agriculture, Conservation and Forestry, a cabinet level agency of the State of Maine.

*Criterion (4) – Describe existing information concerning the subject of the study proposal, and the need for additional information.*

4. To the best of our knowledge, there is limited information available on the current physical characteristics of the boat launches (such as slope, water depth at the bottom of the launch, condition of the launch below full pond) or on functionality at all relevant pool levels.

*Criterion (5) - Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

5. The annual cycle of reservoir draw-down and refilling associated with project operations has the potential to have a direct effect on the usability of boat launch facilities. The circumstance of the impoundment elevation falling below the level at which a facility was designed to function is of particular concern. The Project Operations section of the PAD (Section 4.4) describes annual changes in the North Twin impoundment and Millinocket Lake elevation. Article 408 of the existing license requires that the North Twin impoundment be maintained at a relatively stable level from May 1 - August 22 annually, with a target elevation of 490.41 feet (1.5 feet below full pond) +/- 0.5 feet. A July 26, 2012 Order Approving Amendment of Article 408 set a minimum target level of 488.42 feet (3.5-foot drawdown) for the period August 22 through October 15. Article 402 of the existing license requires that the water level of Millinocket Lake be maintained between 480 feet (full pond) and 470 feet elevation year round.

The Bureau does not have access to and the PAD does not provide historical elevation data for the North Twin impoundment or Millinocket Lake. The Bureau's consideration of this issue would be greatly facilitated by daily average surface elevation data for the North Twin impoundment and Millinocket Lake for the past 10 years, as well as annual water surface elevation curves for the same time period. The study results, which should incorporate this lake elevation data, will help the Bureau determine whether to request that the license include a requirement to improve the boat launches to function at lower lake levels to ensure that the public has trailered boat access at all desired pool levels.

*Criterion (6) – Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

6. The Licensee has proposed a Recreation Facility Inventory and Condition Assessment Study. It is our request that the proposed study evaluate the functionality as well as the condition of the boat launch facilities. This study request proposes that standard engineering and design methodology and criteria for such facilities be applied in the evaluation, to include all relevant

physical dimensions of the launches (e.g., length, slope, water depth, condition), and that the study document the range of surface elevations at which the launches are fully functional. ADA compliance should also be addressed in the assessment.

If these data are not available from existing as-built drawings, we request that measurements be obtained in the field. It may be advantageous to obtain data when the pool levels are at or near the annual minimum; however, the measurements could be conducted at any pool elevation (i.e., when a portion of the ramps may be submerged), with the proper equipment and preparation. The evaluation should include all pool levels that are normally present throughout the period of the year when the lake is ice-free in order to fully determine the adequacy of the facility.

*Criterion (7) – Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

7. The level of effort and cost is commensurate with a project the size of the Penobscot Mills Project and the likely license term. On-site measurement and other evaluation of the launch ramps will likely be needed to assess the function and condition of the ramps at various surface elevations. It is not expected that this on-site work, if necessary, would require more than one or two days.

Thank you for the opportunity to submit these comments. Please feel free to contact me at (207) 287-2163 or via email at Jim.Vogel@maine.gov if you have any questions regarding these comments and study requests.

Sincerely,

James Vogel

James Vogel, FERC Coordinator
Bureau of Parks and Lands

Cc: Amanda Beal, Commissioner, Maine Department of Agriculture, Conservation and Forestry
Andrew Cutko, Director, Bureau of Parks and Lands
John Perry, Maine Department of Inland Fisheries and Wildlife
Randall Dorman, Brookfield Renewable

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JANET T. MILLS
GOVERNOR

MELANIE LOYZIM
COMMISSIONER

*VIA ELECTRONIC FILING*

October 8, 2021

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

RE: Comments on the Pre-Application Document and Study Requests for the Ripogenus (FERC No. 2572) and Penobscot Mills (FERC No. 2458) Hydroelectric Projects

Dear Secretary Bose:

The Maine Department of Environmental Protection (Department or DEP) received and reviewed a Pre-Application Document (PAD), submitted on June 11, 2021, by Great Lakes Hydro America, LLC (GLHA, applicant), a subsidiary of Brookfield Renewable, for the Ripogenus (FERC No. 2572) and Penobscot Mills (FERC No. 2458) Hydroelectric Projects (Projects). Department staff attended the joint agency meeting for the two Projects on September 9, 2021 and reviewed appropriate Project documents to prepare the following comments and study requests.

## Authorities

Historically a Water Quality Certification (WQC) for Ripogenus was issued on April 23, 1993 by the Land Use Planning Commission (LUPC). As of a 1996 Executive Order of the Governor of the State of Maine, MDEP is the certifying agency for projects located wholly or partially in organized towns and cities. Each Project's current FERC license was issued on October 22, 1996. The proposed relicensing of the Ripogenus and Penobscot Mills Projects are subject to water quality certification provisions of Section 401 of the Federal Water Pollution Control Act (a.k.a. Clean Water Act). By the above-mentioned executive Order, the Department is the certifying agency for projects located wholly or partially in organized towns and cities, and as such has jurisdiction over the Projects.

## Project Descriptions

The Ripogenus Project is located on the West Branch in Piscataquis County, Maine, with the approximately 30-mile-long transmission line also extending into Penobscot County, Maine. The principal features of the Ripogenus Project include: 1) a 795-foot-long concrete gravity dam; 2) a 3,850-foot-long tunnel; 3) a powerhouse,wqe known as McKay Station, containing three turbine-generator units with an authorized installed capacity of 37.5 megawatts (MW); 4) a 20.8-mile-

AUGUSTA
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
(207) 287-7688 FAX: (207) 287-7826

BANGOR
106 HOGAN ROAD, SUITE 6
BANGOR, MAINE 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, MAINE 04103
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04769
(207) 764-0477 FAX: (207) 760-3143

website: www.maine.gov/dep

long impoundment having a normal full pond elevation of 941.59 feet with a surface area of 29,270 acres and Umbazooksus Lake with a surface area of 1,600 acres; 5) a 29.4-mile-long transmission line; and 6) a battery energy storage system sized at a capacity of 10 MW for up to 2 hours.

The Penobscot Mills Project is located on the West Branch and Millinocket Stream in Piscataquis and Penobscot Counties, Maine, and includes five developments, in descending order from upstream to downstream, Millinocket Lake Storage, North Twin, Millinocket, Dolby, and East Millinocket, with a total authorized installed capacity of 67.9 MW.

1. The Millinocket Lake Storage Development includes: 1) an impoundment having a normal full pond elevation of 480.0 feet with a surface area of 8,640 acres; 2) a concrete and earth-filled dam, measuring approximately 635 feet in length, located at the outlet of Millinocket Lake; and 3) a pumping station containing two pumps, located approximately 6.2 miles from the dam, two 4-foot-6-inch-diameter steel pipes measuring approximately 544 feet in length, and a concrete outlet structure discharging to Ambajejus Lake (within the North Twin impoundment). No hydroelectric generating facilities are located at this development.

2. The North Twin Development includes: 1) an impoundment having a normal full pond elevation of 491.92 feet with a surface area of 17,790 acres; 2) a concrete and earth-filled dam measuring approximately 1,051 feet in length, including an intake structure and powerhouse containing three turbine-generator units and appurtenant equipment; 3) a series of six earthen dikes having a combined length of 2,530 feet, located upstream of the dam; 4) a 60 Hertz (Hz) substation containing six transformers; and 5) a transmission line approximately 4.2 miles in length that extends to the last transmission pole structure before entering GLHA’s Millinocket Substation #4.

3. The Millinocket Development includes: 1) an impoundment having a normal full pond elevation of 458.7 feet with a surface area of 1,344 acres; 2) a concrete dam (Stone Dam) measuring approximately 1,262 feet in length; 3) a gatehouse located at the dam, containing ten gates and a sluiceway; 4) three earthen dikes in Quakish Lake with a total length of 1,854 feet; 5) five earthen dikes in Ferguson Pond with a total length of 3,195 feet, a "western" canal leading from the gatehouse to Ferguson Pond, and an "eastern" canal leading from Ferguson Pond to the intake structure, all of which are used to convey water from the gatehouse at Stone Dam to the intake structure located approximately 7,300 feet from Stone Dam; 6) an intake structure containing seven headgates, located at the entrance of the penstocks; 7) six 10-foot-diameter steel penstocks and one 11-foot-diameter steel penstock ranging in length from 1,007 feet to 1,024 feet; 8) a powerhouse containing seven operable turbine-generator units, of which five are located within the former Grinder Room and two are in the Generator Room; 9) two transformers, one having a rated capacity of 30/40/50 megavolt-amperes (MVA) and one at 24/34/40 MVA; and 10) two 60 Hz transmission lines approximately 300 feet in length (one 6.9 kilovolt [kV] and one 13.8 kV).

4. The Dolby Development includes: 1) an impoundment having a normal full pond elevation of 336.2 feet with a surface area of 2,048 acres; 2) a concrete and earth-filled dam measuring approximately 1,395 feet in length, including an intake structure and powerhouse integral with the dam containing four operable turbine-generator units and other appurtenant equipment; 3) a 60 Hz substation containing one transformer having a rated capacity of 15/20 MVA and a second transformer with a rated capacity of 5 MVA; and (4) a transmission line extending approximately 2 miles to the last transmission pole structure before entering GLHA's Powersville Substation.

5. The East Millinocket Development includes: 1) an impoundment having a normal full pond elevation of 287.2 feet with a surface area of 128 acres; 2) a concrete and earth-filled dam measuring approximately 717.5 feet long, including an intake structure and powerhouse integral with the dam containing six turbine-generator units; and 3) a tailrace measuring approximately 1,050 feet long.

The Project also contains two battery energy storage systems each sized at a capacity of 10 MW for up to 2 hours (or combined capacity of 20 MW for 2-hour duration) and are located at the Millinocket Substation #4 and Powersville Substation.

**Water Quality Classifications and Standards**

Water quality standards and the water quality classifications of all surface waters of the State have been established by Maine Legislature (Title 38 M.R.S. §§ 464-468). The following classifications apply to the waters of the West Branch of the Penobscot River and Millinocket Stream affected by the operation of the Ripogenus and Penobscot Mills Projects:

"From its confluence with Chesuncook Lake to Ripogenus Dam – GPA;

From Ripogenus Dam through Ripogenus Gorge to McKay Station – Class B;

From McKay Station to its confluence with Ambajejus Lake – Class A;

North Twin Impoundment – GPA;

Millinocket Lake Impoundment – GPA;

From the outlet of Elbow Lake to the outlet of Quakish Lake and Ferguson Pond to its confluence with Millinocket Stream (includes the Back Channel) – Class C;

From the confluence with Millinocket Stream to its confluence with the East Branch of the Penobscot River, including all impoundments – Class B;

West Branch of the Penobscot River – Tributaries (includes Millinocket Stream) – Class A;

Millinocket Stream, from the railroad bridge near the Millinocket-T3 Indian Purchase boundary to its confluence with the West Branch Canal – Class B;

Millinocket Stream from the confluence of the West Branch Canal to its confluence with the West Branch of the Penobscot River – Class B."

Class GPA waters must be of such quality that they are suitable for the designated uses of drinking water after disinfection, recreation in and on the water, fishing, agriculture, industrial process and cooling water supply, hydroelectric power generation, navigation and as habitat for fish and other aquatic life. The habitat must be characterized as natural.

Class GPA waters must be described by their trophic state based on measures of the chlorophyll "a" content, Secchi disk transparency, total phosphorus content and other appropriate criteria. Class GPA waters must have a stable or decreasing trophic state, subject only to natural fluctuations, and must be free of culturally induced algal blooms that impair their use and enjoyment.

There may be no new direct discharge of pollutants into Class GPA waters[1].

Class A waters must be of such quality that they are suitable for the designated uses of drinking water after disinfection; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; navigation; and as habitat for fish and other aquatic life. The habitat must be characterized as natural.

The dissolved oxygen (DO) content of Class A water shall not be less than 7 parts per million or 75% of saturation, whichever is higher. The aquatic life and bacteria content of Class A water shall be as naturally occurs.

Except as provided in statute[2], direct discharges to these waters licensed after January 1, 1986 are permitted only if, in addition to satisfying all the requirements of this article, the discharged effluent will be equal to or better than the existing water quality of the receiving waters.

Class B waters must be of such quality that they are suitable for the designated uses of drinking water after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation; navigation; and as habitat for fish and other aquatic life. The habitat must be characterized as unimpaired.

The DO content of Class B waters may not be less than 7 parts per million or 75% of saturation, whichever is higher, except that for the period from October 1st to May 14th, in order to ensure spawning and egg incubation of indigenous fish species, the 7-day mean DO concentration may

[1] M.R.S § 465-A(1)(C)
[2] M.R.S. § 465 (2)(C)

not be less than 9.5 parts per million and the 1-day minimum DO concentration may not be less than 8.0 parts per million in identified fish spawning areas[3].

Discharges to Class B waters may not cause adverse impact to aquatic life in that the receiving waters must be of sufficient quality to support all aquatic species indigenous to the receiving water without detrimental changes in the resident biological community.
Class C waters must be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, navigation; and as a habitat for fish and other aquatic life.

The DO content of Class C water may not be less than 5 parts per million or 60% of saturation, whichever is higher, except that in identified salmonid spawning areas where water quality is sufficient to ensure spawning, egg incubation and survival of early life stages, that water quality sufficient for these purposes must be maintained in order to provide additional protection for the growth of indigenous fish[4].

Discharges to Class C waters may cause some changes to aquatic life, except that the receiving waters must be of sufficient quality to support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community.

**Antidegradation**

The State's antidegradation policy provides that water quality certification may be approved only if the applicable standards of classification of the affected water body are met and existing in-stream uses and the level of water quality necessary to protect those existing uses are maintained and protected. The policy also provides that, where the actual quality of any classified water exceeds the minimum standards of the next highest classification, that higher water quality classification shall be maintained and protected.[5]

**Comments on the Pre-Application Document (PAD)**

The Department appreciates the effort of the applicant to prepare the PAD. The PAD provides an understanding of the Project facilities, the surrounding resources, and current and proposed project operations. The PAD also provides information from which issues related to relicensing can be readily identified. After review of the available documents, the Department has the following comments on the PAD:

(1) The Department acknowledges that a UAA was issued in 1992 for the Ripogenus Project and was referenced in the PAD document. A UAA typically requires studies, reports data and discusses the impacts of impoundment drawdowns on impoundment habitat. UAA's often cover extended drawdown of impoundments. As a result of the Ripogenus

[3] M.R.S § 465 (3)(B)
[4] M.R.S.§ 465(4)(B)(1) & (2)
[5] See Title 38 M.R.S.A §464(4)(F)

Development changing jurisdiction as described above in the Authorities section of this letter, the Department does not have sufficient documentation of the UAA associated with the Ripogenus Project[6]. Though the Department understands the document likely remains in effect at the Ripogenus Project[7], the Department requires the Applicant to submit the UAA for Department review and further studies on the impoundment aquatic habitat may be required in the Ripogenus Development as described below.

(2) In the PAD, the Applicant summarizes many historical water quality studies in Section 5.3.9 and asserts that water quality standards are being met throughout several impoundment and riverine sections of the West Branch of the Penobscot River related to the Ripogenus and Penobscot Mills Projects. To date, GLHA has not provided (1) the studies referenced in the PAD; or (2) operations data for any of the projects.
In the PAD the Applicant states *"…GLHA maintains that a full suite of new studies is not needed, that the vast body of information on which today's certifications and licenses are soundly based and should be relied upon for these relicensings. In addition, consistent with the Commission's criteria for study requests, the scope and extent of any new study be focused on addressing specific data gaps necessary to inform the development of license requirements."*

While broad summaries of the studies performed during the last relicensing were provided in the PAD, a synthesis of the data was not, nor were any data gaps identified by the Applicant. The Department has determined that studies previously conducted are not sufficient to demonstrate that Water Quality standards are being met at the Projects today, and that the data presented in the PAD is only a high-level summary. Without the original studies, and without operations data for each dam, MDEP cannot identify existing data gaps to inform their respective Study Requests or their PAD comments. Therefore, the Department respectively disagrees that the data on file demonstrates that they meet Classification Standards today and requests that the Applicant provide the Department with each study referenced in the PAD.

**Water Quality Study Requests**

Proposed WQ Studies

In the PAD in Tables 6.2-1 and 6.2-2 the Applicant proposes water quality studies to be conducted for both Projects.

For the Ripogenus Project, the Applicant proposes lake trophic sampling and tailwater sampling of temperature and DO at one station between the Ripogenus dam and McKay Station. GLHA proposes macroinvertebrate sampling below McKay Station as an additional study.

[6] Caribou Lake, Ripogenus Lake, Black Pond, Brandy Pond, Umbazokus Lake, Chesuntcook Lake figure 4.2-2
[7] Section 464 9-A(A)

For the Penobscot Mills Project, the Applicant identifies Millinocket Lake (deep area upstream of dam), the North Twin impoundment (deep area of Elbow Lake), the Millinocket impoundment (deep area of Ferguson Pond), the Dolby impoundment (deep area upstream of dam), and the East Millinocket impoundment (deep area upstream of dam) as study locations to conduct lake trophic sampling. Further proposed studies include tailwater temperature and DO sampling at one location in each of the riverine/tailwater areas: Millinocket Stream downstream of the Millinocket Lake Dam and the West Branch in the North Twin tailrace, downstream of Stone Dam, the Millinocket tailrace, the Dolby tailrace, and the East Millinocket tailrace. Lastly, they identify Millinocket Stream downstream of the dam, the North Twin tailrace, the Millinocket tailrace, the Dolby tailrace, and the East Millinocket tailrace as locations to sample macroinvertebrates. All studies are proposed according to MDEP protocols.

Study Requests

The Department has determined that GLHA has not proposed sufficient studies to demonstrate that either Project meets WQ standards. Further no habitat studies are proposed in any of the Project impoundments or downstream of these Projects.

It has been the Department's practice to determine the metrics, methods, timing, and duration of water quality monitoring necessary to ensure that the water quality studies meet data quality objectives. The Department requests that the applicant conduct water quality studies that include the following parameters and adhere to the Department's established sampling protocols in support of water quality certification. Formal study requests following FERC's Integrated Licensing Process (ILP) criteria are attached to this comment letter.

**Impoundment Trophic State Study -** The purpose of trophic state study is to determine if the Project impoundment and its associated basins have a stable or improving trophic state subject only to natural fluctuations and are free of algal blooms that impair the impoundment use or enjoyment. The objective of this study is to determine if the Project impoundment and its basins meets Maine Water Quality Standards, including dissolved oxygen criteria, and the designated use of recreation in and on the water. The PAD presents summarized data collected in 1991, however, these studies are insufficient to demonstrate that the various impoundment basins exhibit a stable or improving trophic state. The applicant proposes some Trophic State Studies outlined above to demonstrate whether the Project meets water quality standards.

Ripogenus

The Department requires an Impoundment Trophic State Study be conducted in the Ripogenus impoundment, including the waters of Ripogenus Lake, Caribou Lake, Brandy Pond, Black Pond, Chesuncook Lake, Umbazokus Lake. Assessment of the above-mentioned criteria provides information to evaluate the health and impact of the dam structure and operation on the West Branch of the Penobscot River. The Department requires GLHA to conduct their sampling at the deepest part of each basin identified above according to the *DEP Sampling Protocol for Hydropower Studies* (March 2021) to determine if Maine's water quality standards are met.

Penobscot Mills

The Department requires an Impoundment Trophic State Study be conducted in the Penobscot Mills impoundment, including the waters of Millinocket Lake, North Twin Development (including Ambajejus Lake, Pemadumcook Lake, and South Twin Lake), Quakish Lake and Ferguson Pond, and Dolby Pond. Similarly, the Department requires GLHA to conduct their sampling at the deepest part of each basin identified above according to the *DEP Sampling Protocol for Hydropower Studies* (March 2021) to determine if Maine's water quality standards are met.

**Impoundment Aquatic Habitat Studies -** The purpose of this study is to determine the effect of drawdowns on the impoundment or basin's littoral zone and the ability of those water bodies to support fish and other aquatic life. Measurements of Secchi disk transparency and bathymetric data are applied to determine the extent of the littoral zone in the impoundments and an assessment of the volume and surface area dewatered under normal operating conditions, to determine if at least 75% of the littoral zone remains watered at all times. The PAD references but does not present any information regarding littoral habitats associated with the various Project impoundments and the Applicant does not propose to conduct habitat assessment studies.

Ripogenus

The Ripogenus Project is operated as a water storage facility with an impoundment and multiple basins; therefore, normal operations may impact the littoral zone of the impoundment and these basins. As described above in the PAD comments section of this letter, the 1992 UAA may established that the Ripogenus Development meets the aquatic habitat and life standards for GPA waters. However, the Department requires the Applicant submit the UAA that remains in effect at the Ripogenus Project for review. The Applicant must consult with the Department during preparation of the Proposed Study Plan to determine if the Impoundment Aquatic Habitat Studies in the Ripogenus Development must be conducted.

If required, the Applicant should conduct the Impoundment Aquatic Habitat Study following the "Habitat Study" protocol under "Lakes, Ponds, and Impoundments" in the *DEP Sampling Protocol for Hydropower Studies* (March 2021), which is attached to this comment letter. The Department requests that this study be conducted in the Ripogenus impoundment, including the waters of Ripogenus Lake, Caribou Lake, Brandy Pond, Black Pond, Chesuncook Lake, Umbazokus Lake.

Penobscot Mills

The Penobscot Mills Project is operated as a water storage facility with an impoundment and multiple basins; therefore, normal operations may impact the littoral zone of the impoundment and these basins. The Applicant does not propose to conduct habitat assessment studies. The Applicant should conduct the Impoundment Aquatic Habitat Study following the "Habitat Study" protocol under "Lakes, Ponds, and Impoundments" in the *DEP Sampling Protocol for Hydropower Studies* (March 2021), which is attached to this comment letter. The Department

requests that this study be conducted in the waters of Millinocket Lake, North Twin Development (including Ambajejus Lake, Pemadumcook Lake, and South Twin Lake), Quakish Lake and Ferguson Pond, and Dolby Pond. Information will be used to evaluate whether the project meets Maine's habitat and aquatic life criteria, and the designated use of habitat for fish and other aquatic life

**Downstream Temperature and Dissolved Oxygen -** Temperature and DO must be monitored downstream of the Project dams to ensure that discharges from the hydropower projects are sufficient to maintain the resident biological community in the downstream habitats of the Ripogenus and the Penobscot Mills Developments. Dissolved oxygen concentrations in waters downstream of each Project dam must meet Maine water quality criteria as classified in 38 M.R.S. § 467. The Project PAD indicates that water quality in the West Branch of the Penobscot River meets all applicable water quality standards, however such assertions are based on samples collected in 1991, prior to an application for a new FERC license for the Project and may not be representative of current water quality conditions. The PAD indicates that temperature and DO monitoring is planned for these Projects.

Ripogenus

The Department requires temperature and DO to be sampled downstream of the Ripogenus dam and downstream of McKay Station. Assessment of temperature and DO data in the downstream reaches will be used to determine if the hydropower project currently meets Maine Water Quality Standards including Class B and Class A DO criteria, respectively. Data must be collected in accordance with the Department's "Temperature and Dissolved Oxygen Study" protocol under "Rivers and Streams" in the *DEP Sampling Protocol for Hydropower Studies* (March 2021), which is attached to this comment letter. As noted in the protocol, the applicant will need to consult with the Department to verify representative sampling locations as the study plan is developed.

Penobscot Mills

The Department requires temperature and DO to be sampled downstream of the Millinocket Lake Storage Development dam and the North Twin Development dam, downstream of the Stone dam[8], in Millinocket Stream within the tailrace of the Millinocket Development dam, downstream of the Dolby Development dam and downstream of the East Millinocket Development dam. Assessment of temperature and DO data in the downstream reaches will be used to determine if the hydropower project currently meets Maine Water Quality Standards including Class A, Class B and Class C DO criteria, in accordance with classification standards established within 38 M.R.S. § 467. Data must be collected in accordance with the Department's "Temperature and Dissolved Oxygen Study" protocol under "Rivers and Streams" in the *DEP Sampling Protocol for Hydropower Studies* (March 2021), which is attached to this comment letter. As noted in the protocol, the applicant will need to consult with the Department to verify representative sampling locations as the study plan is developed.

[8] In the original channel of the West Branch of the Penobscot River, also referred to as the Back Channel.

**Aquatic Habitat Cross-Sectional Flow Study -** The purpose of this study is to evaluate whether current Project operations affect attainment of habitat standards for fish and other aquatic life in the river below the Ripogenus and Penobscot Mills Developments. An aquatic habitat cross-section flow study measures depth, velocity, and wetted width along established transects at various discharges to determine flows where at least 75% of the stream cross-sectional area has enough water to provide sufficient habitat for fish and other aquatic organisms. Agency file review indicates data is insufficient and the Applicant does not propose to conduct downstream habitat assessment studies.

Ripogenus

The Department requires that the Applicant assess aquatic habitat downstream of the Ripogenus dam. Data will be evaluated to determine if the downstream waters provide sufficient quantity of water to maintain riverine aquatic habitat in the bypass and tailrace reaches. The Applicant must conduct the Cross-Sectional Flow Study following the "Habitat and Aquatic Life Studies" protocol under "Rivers and Streams" in the *DEP Sampling Protocol for Hydropower Studies* (March 2021), which is attached to this comment letter.

Penobscot Mills

The Department requires that the Applicant assess aquatic habitat downstream of the Penobscot Mills dams at Millinocket Lake, North Twin Development, Quakish Lake (Stone dam) and Ferguson Pond (powerhouse tailrace in Millinocket Stream), Dolby Development dam and East Millinocket Development dam. The Applicant must conduct the Cross-Sectional Flow Study following the "Habitat and Aquatic Life Studies" protocol under "Rivers and Streams" in the *DEP Sampling Protocol for Hydropower Studies* (March 2021), which is attached to this comment letter.

**Downstream Benthic Macroinvertebrates Study-** Assessment of the benthic macroinvertebrate community is required to determine whether current in-stream flow releases are affecting attainment of habitat and aquatic life criteria in the waters downstream of these Projects. The assessment provides biological data to evaluate potential impacts caused by project operations. Replicate benthic macroinvertebrate sample collectors are deployed for a 28-day study period in the tailrace reach of the hydropower project during low flow, high temperature conditions. Agency file review indicates data is insufficient to evaluate the current aquatic community in the bypass and tailrace reaches downstream of the Project Development dams. The PAD indicates that a study of this nature is planned for the project. Sample location must be determined in coordination with the Department.

Ripogenus

The Department requires sampling of macroinvertebrates in the West Branch of the Penobscot River below the Ripogenus dam and downstream of the McKay Station powerhouse to determine whether current in-stream flow releases affect attainment of Maine habitat and aquatic life

criteria for Class B and Class A waters. The applicant must conduct this study following DEP's standard protocol *in Methods for Biological Sampling and Analysis of Maine's River and Streams* (April 2014), attached to this comment letter.

Penobscot Mills

The Department also requires sampling of macroinvertebrates in Millinocket Stream and in the West Branch of the Penobscot River downstream of the Millinocket Lake Storage Development dam, downstream of the North Twin Development dam, downstream of the Stone dam[9], in Millinocket Stream within the tailrace of the Millinocket Development dam, downstream of the Dolby Development dam and downstream of the East Millinocket Development dam. This will allow the Department to determine if current in-stream flow releases affect attainment of Maine habitat and aquatic life criteria the applicable Class A, Class B and Class C waters. The applicant must conduct this study following DEP's standard protocol in *Methods for Biological Sampling and Analysis of Maine's River and Streams* (April 2014), attached to this comment letter.

MDEP supports study requests prepared by other natural resource agencies, including but not limited to, Maine Department of Inland Fish and Wildlife (MDIFW), Maine Department of Marine Resources (MDMR), US Fish and Wildlife (USFWS), National Marine Fisheries Service (NMFS), and New Hampshire state agencies.

Thank you for the opportunity to comment on the PAD for the Ripogenus and Penobscot Mills Hydroelectric Project. If you have any questions, please contact me by phone at (207) 446-1619 or by email at Christopher.Sferra@maine.gov.

Sincerely,



Christopher O. Sferra
Hydropower Program, Project Manager
Maine Department of Environmental Protection

Attachment:

*DEP sampling Protocol for Hydropower Studies* (March 2021)
*Methods for Biological Sampling and Analysis of Maine's River and Streams* (April 2014)

[9] In the original channel of the West Branch of the Penobscot River, also referred to as the Back Channel.

Maine Department of Environmental Protection
Study Request
Ripogenus Hydropower Project (FERC No. 2572)

**Impoundment Trophic State Study**

1. **Describe the goals and objectives of each study proposal and the information to the obtained.**
   Trophic state is an important indicator of water quality within the impoundment. Assessment of this criteria provides information to evaluate the health of the Ripogenus impoundment, including the waters of Ripogenus Lake, Caribou Lake, Brandy Pond, Black Pond, Chesuncook Lake, Umbazokus Lake and the impact of the dam structure and operation on the West Branch of the Penobscot River. The objective of this study proposal is to determine if the project impoundment meets Maine Water Quality Standards, including dissolved oxygen criteria, and the designated use of recreation in and on the water. This study will assess whether the trophic state of the impoundment is stable or improving.

2. **If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.**
   The resource management goal is to ensure attainment of Maine Water Quality Standards pursuant to the provisions of the *Water Classification Program*, 38 M.R.S. Sections 464-468 and to certify attainment of such, with any necessary conditions, under Section 401 of the Federal Water Pollution Control Act (a.k.a. Clean Water Act).

3. **If the requestor is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.**
   Requestor is a resource agency.

4. **Describe existing information concerning the subject of the study proposal, and the need for additional information.**
   The PAD presents summarized data collected in 1991, and the applicant proposes to conduct Trophic State Studies to demonstrate whether the Project meets water quality standards. As described in the Department's PAD comment letter, the applicant will need to demonstrate that the project operation meet dissolved oxygen and other water quality standards in the impoundment and that the trophic state is stable or declining in order to obtain water quality certification.

5. **Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.**
   Data collected will identify trophic state and may identify stratification effects on the impounded water and habitat. Information will be used to evaluate whether the project meets Maine designated uses, habitat and aquatic life criteria, and dissolved oxygen criteria, which will inform the water quality certification process.

6. **Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate filed season(s) and duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.**
   The DEP Sampling Protocol for Hydropower Studies (March 2021) was established by Department staff and has been used successfully throughout the State by the DEP and others. A copy of the Department protocol is attached to the PAD comment letter.

7. **Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs.**
   Trophic state samples are collected twice each month for five consecutive months during open water season. An impoundment aquatic habitat study can be completed in one field season. Costs are considered reasonable given that this study is required for Maine water quality certification and is routinely completed at hydropower projects being relicensed in the State. No alternatives to this study are proposed.

Maine Department of Environmental Protection
Study Request
Penobscot Mills Hydropower Project (FERC No. 2458)

**Impoundment Trophic State Study**

1. **Describe the goals and objectives of each study proposal and the information to the obtained.**
   Trophic state is an important indicator of water quality within the impoundment. Assessment of this criteria provides information to evaluate the health of the Penobscot Mills impoundments, including Millinocket Lake, North Twin Development (including Ambajejus Lake, Pemadumcook Lake, and South Twin Lake), Quakish Lake and Ferguson Pond, and Dolby Pond, and the impact of the dam structures and operations on Millinocket Stream and on the West Branch of the Penobscot River. The objective of this study proposal is to determine if the project impoundments meet Maine Water Quality Standards, including dissolved oxygen criteria, and the designated use of recreation in and on the water. This study will assess whether the trophic state of each of the Project impoundments is stable or improving.

2. **If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.**
   The resource management goal is to ensure attainment of Maine Water Quality Standards pursuant to the provisions of the *Water Classification Program*, 38 M.R.S. Sections 464-468 and to certify attainment of such, with any necessary conditions, under Section 401 of the Federal Water Pollution Control Act (a.k.a. Clean Water Act).

3. **If the requestor is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.**
   Requestor is a resource agency.

4. **Describe existing information concerning the subject of the study proposal, and the need for additional information.**
   The PAD presents summarized data collected in 1991, and the applicant proposes to conduct Trophic State Studies to demonstrate whether the Project impoundments meet water quality standards. As described in the Department's PAD comment letter, the applicant will need to demonstrate that the project operation meet dissolved oxygen and other water quality standards in the impoundment and that the trophic state is stable or declining in order to obtain water quality certification.

5. **Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.**
   Data collected will identify trophic state and may identify stratification effects on the impounded water and habitat. Information will be used to evaluate whether the project

meets Maine designated uses, habitat and aquatic life criteria, and dissolved oxygen criteria, which will inform the water quality certification process.

6. **Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate filed season(s) and duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.**
   The DEP Sampling Protocol for Hydropower Studies (March 2021) was established by Department staff and has been used successfully throughout the State by the DEP and others. A copy of the Department protocol is attached to the PAD comment letter.

7. **Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs.**
   Trophic state samples are collected twice each month for five consecutive months during open water season. An impoundment aquatic habitat study can be completed in one field season. Costs are considered reasonable given that this study is required for Maine water quality certification and is routinely completed at hydropower projects being relicensed in the State. No alternatives to this study are proposed.

Maine Department of Environmental Protection
Study Request
Ripogenus Hydropower Project (FERC No. 2572)

**Impoundment Aquatic Habitat Study**

1. **Describe the goals and objectives of each study proposal and the information to the obtained.**
   The objective of this study proposal is to determine if the project impoundments, including the waters of Ripogenus Lake, Caribou Lake, Brandy Pond, Black Pond, Chesuncook Lake and Umbazokus Lake meet Maine Water Quality Standards including habitat and aquatic life criteria. Measurements of Secchi disk transparency and bathymetric data are applied to determine the extent of the littoral zone in the impoundments and an assessment of the volume and surface area dewatered under normal operating conditions, to determine if at least 75% of the littoral zone remains watered at all times. Assessment of the shoreline littoral environment is necessary to evaluate the impact of Project operations on habitat there to determine if the Project attains Maine's aquatic life criteria, a narrative water quality standard.

2. **If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.**
   The resource management goal is to ensure attainment of Maine Water Quality Standards pursuant to the provisions of the *Water Classification Program*, 38 M.R.S. Sections 464-468 and to certify attainment of such, with any necessary conditions, under Section 401 of the Federal Water Pollution Control Act (a.k.a. Clean Water Act).

3. **If the requestor is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.**
   Requestor is a resource agency.

4. **Describe existing information concerning the subject of the study proposal, and the need for additional information.**
   The PAD references and existing 1992 UAA but does not present any information regarding maintenance of the littoral habitats associated with the various Ripogenus impoundments and the applicant does not propose to conduct habitat assessment studies. Through changes in jurisdiction of the Project through the LUPC and MDEP, the Department does not have adequate documentation of the UAA and the Department requests that the UAA be submitted for Department review. As described in the PAD comments, the Impoundment Habitat Studies may need to be conducted in each of the Project impoundments to demonstrate that the Project impoundments meet habitat and aquatic life criteria under the proposed operating conditions.

5. **Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.**

Data collected will identify any drawdown effects on the littoral zone habitats in each of the Project impoundments. Information will be used to evaluate whether the project meets Maine's habitat and aquatic life criteria, and the designated use of habitat for fish and other aquatic life, which will inform the water quality certification process.

6. **Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate filed season(s) and duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.**
   The DEP Sampling Protocol for Hydropower Studies (March 2021) was established by Department staff and has been used successfully throughout the State by the DEP and others. A copy of the Department protocol is attached to the PAD comment letter.

7. **Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs.**
   The Impoundment Aquatic Habitat Study can be completed in one field season, and can be designed as a desktop study utilizing data collected in the Trophic State Study. Costs are considered reasonable given that this study is required for Maine water quality certification and is routinely completed at hydropower projects being relicensed in the State. The Applicant must submit the existing UAA and must consult with the Department concerning this study as they prepare their PSP.

Maine Department of Environmental Protection
Study Request
Penobscot Mills Hydropower Project (FERC No. 2458)

**Impoundment Aquatic Habitat Study**

8. **Describe the goals and objectives of each study proposal and the information to the obtained.**
   The objective of this study proposal is to determine if the project impoundments, including Millinocket Lake, North Twin Development (including Ambajejus Lake, Pemadumcook Lake, and South Twin Lake), Quakish Lake and Ferguson Pond, and Dolby Pond meet Maine Water Quality Standards including habitat and aquatic life criteria. Measurements of Secchi disk transparency and bathymetric data are applied to determine the extent of the littoral zone in the impoundments and an assessment of the volume and surface area dewatered under normal operating conditions, to determine if at least 75% of the littoral zone remains watered at all times. Assessment of the shoreline littoral environment is necessary to evaluate the impact of Project operations on habitat there to determine if the Project attains Maine's aquatic life criteria, a narrative water quality standard.

9. **If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.**
   The resource management goal is to ensure attainment of Maine Water Quality Standards pursuant to the provisions of the *Water Classification Program*, 38 M.R.S. Sections 464-468 and to certify attainment of such, with any necessary conditions, under Section 401 of the Federal Water Pollution Control Act (a.k.a. Clean Water Act).

10. **If the requestor is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.**
    Requestor is a resource agency.

11. **Describe existing information concerning the subject of the study proposal, and the need for additional information.**
    The PAD does not present any information regarding maintenance of the littoral habitats associated with the various Penobscot Mills impoundments and the applicant does not propose to conduct habitat assessment studies. The Department requests that Impoundment Habitat Studies be conducted in each of the Project impoundments to demonstrate that the Project impoundments meet habitat and aquatic life criteria under the proposed operating conditions.

12. **Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.**
    Data collected will identify any drawdown effects on the littoral zone habitats in each of the Project impoundments. Information will be used to evaluate whether the project

meets Maine's habitat and aquatic life criteria, and the designated use of habitat for fish and other aquatic life, which will inform the water quality certification process.

13. **Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate filed season(s) and duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.**
The DEP Sampling Protocol for Hydropower Studies (March 2021) was established by Department staff and has been used successfully throughout the State by the DEP and others. A copy of the Department protocol is attached to the PAD comment letter.

14. **Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs.**
The Impoundment Aquatic Habitat Study can be completed in one field season, and can be designed as a desktop study utilizing data collected in the Trophic State Study. Costs are considered reasonable given that this study is required for Maine water quality certification and is routinely completed at hydropower projects being relicensed in the State. No alternatives to this study are proposed.

Maine Department of Environmental Protection
Study Request
Ripogenus Hydropower Project (FERC No. 2572)

**Downstream Temperature and Dissolved Oxygen Study**

1. **Describe the goals and objectives of each study proposal and the information to the obtained.**
   Temperature and dissolved oxygen (DO) are important indicators of water quality to ensure that discharges from the hydropower project are sufficient to maintain the resident biologic community downstream of the Ripogenus dam and downstream of McKay Station. Assessment of temperature and DO data in the downstream reaches will be used to determine if the hydropower project currently[10] meets Maine Water Quality Standards including Class B and Class A DO criteria, respectively.

2. **If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.**
   The resource management goal is to ensure attainment of Maine Water Quality Standards pursuant to the provisions of the *Water Classification Program*, 38 M.R.S. Sections 464-468 and certify attainment of such, with any necessary conditions, under Section 401 of the Federal Water Pollution Control Act (a.k.a. Clean Water Act)

3. **If the requestor is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.**
   Requestor is a resource agency.

4. **Describe existing information concerning the subject of the study proposal, and the need for additional information.**
   Dissolved oxygen concentrations downstream of the Ripogenus dam must meet Maine water quality criteria for Class B waters and must meet water quality criteria for Class A in waters downstream of the McKay Station. Agency file review indicates temperature and dissolved oxygen data are insufficient to assess current attainment of these criteria. The PAD indicates that a study of this nature is planned for the project; data collection sites must be chosen in coordination with the Department.

5. **Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.**
   Data collected will be used to evaluate project effects on water temperature and DO concentrations in the West Branch of the Penobscot River downstream of the Ripogenus

[10] The Project PAD indicates that water quality in the West Branch of the Penobscot River is good and meets all applicable water quality standards, however such assertions are based on samples collected in 1991, prior to an application for a new FERC license for the Project, and may not be representative of current water quality conditions.

dam. Information will be used to evaluate whether the project meets Maine DO criteria for Class A waters and will inform the water quality certification process.

6. **Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate filed season(s) and duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.**
   The DEP Sampling Protocol for Hydropower Studies (March 2021) was established by Department staff and has been used successfully throughout the State by the DEP and others. A copy of the Department protocol is attached to the PAD comment letter.

7. **Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs.**
   The DEP Sampling Protocol for Hydropower Studies (March 2021) offers two options for the temperature and DO study that can be completed in one field season. Temperature and DO samples can be collected one day per week for at least 10 weeks or measured hourly using data sondes placed at designated locations during summer low flow, high water temperature conditions (e.g. July and August). The Department prefers the second method. Costs are considered reasonable given that this study is required for Maine water quality certification and is routinely completed at hydropower projects being relicensed in the State. No alternatives to this study are proposed.

Maine Department of Environmental Protection
Study Request
Penobscot Mills Hydropower Project (FERC No. 2458)

**Downstream Temperature and Dissolved Oxygen Study**

1. **Describe the goals and objectives of each study proposal and the information to the obtained.**
   Temperature and dissolved oxygen (DO) are important indicators of water quality to ensure that discharges from the hydropower project are sufficient to maintain the resident biologic community downstream of the Millinocket Lake Storage Development dam, the North Twin Development dam, downstream of the Stone dam[11], in Millinocket Stream within the tailrace of the Millinocket Development dam, downstream of the Dolby Development dam and downstream of the East Millinocket Development dam. Assessment of temperature and DO data in the downstream reaches will be used to determine if the hydropower project currently[12] meets Maine Water Quality Standards including Class A, Class B and Class C DO criteria, in accordance with classification standards[13].

2. **If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.**
   The resource management goal is to ensure attainment of Maine Water Quality Standards pursuant to the provisions of the *Water Classification Program*, 38 M.R.S. Sections 464-468 and certify attainment of such, with any necessary conditions, under Section 401 of the Federal Water Pollution Control Act (a.k.a. Clean Water Act)

3. **If the requestor is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.**
   Requestor is a resource agency.

4. **Describe existing information concerning the subject of the study proposal, and the need for additional information.**
   Dissolved oxygen concentrations in waters downstream of each Project dam must meet Maine water quality criteria as classified in 38 M.R.S. § 467. Agency file review indicates temperature and dissolved oxygen data is insufficient to assess current attainment of these criteria. The PAD indicates that a study of this nature is planned for the project; data collection sites must be chosen in coordination with the Department.

[11] In the original channel of the West Branch of the Penobscot River, also referred to as the Back Channel.
[12] The Project PAD indicates that water quality in the West Branch of the Penobscot River is good and meets all applicable water quality standards, however such assertions are based on samples collected in 1991, prior to an application for a new FERC license for the Project and may not be representative of current water quality conditions.
[13] Classification of each river reach is determined within 38 M.R.S. § 467.

5. **Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.**
   Data collected will be used to evaluate project effects on water temperature and DO concentrations in the West Branch of the Penobscot River and in Millinocket Stream downstream of each Penobscot Mills Project dam. Information will be used to evaluate whether the project meets Maine DO criteria for the appropriate classification standard and will inform the water quality certification process.

6. **Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate filed season(s) and duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.**
   The DEP Sampling Protocol for Hydropower Studies (March 2021) was established by Department staff and has been used successfully throughout the State by the DEP and others. A copy of the Department protocol is attached to the PAD comment letter.

7. **Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs.**
   The DEP Sampling Protocol for Hydropower Studies (March 2021) offers two options for the temperature and DO study that can be completed in one field season. Temperature and DO samples can be collected one day per week for at least 10 weeks or measured hourly using data sondes placed at designated locations during summer low flow, high water temperature conditions (e.g. July and August). The Department prefers the second method. Costs are considered reasonable given that this study is required for Maine water quality certification and is routinely completed at hydropower projects being relicensed in the State. No alternatives to this study are proposed.

Maine Department of Environmental Protection
Study Request
Ripogenus Hydropower Project (FERC No. 2572)

**Aquatic Habitat Cross-Section Flow Study**

1. **Describe the goals and objectives of each study proposal and the information to the obtained.**
   Assessment of aquatic habitat downstream of the Ripogenus dam is required to determine whether current in-stream flow releases meet Maine habitat and aquatic life criteria. An aquatic habitat cross-section flow study measures depth, velocity, and wetted width along established transects at various discharges to determine flows where at least 75% of the

stream cross-sectional area has enough water to provide sufficient habitat for fish and other aquatic organisms. Data will be evaluated to determine if the downstream waters provide sufficient quantity of water to maintain riverine aquatic habitat in the bypass and tailrace reaches.

2. **If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.**
   The resource management goal is to ensure attainment of Maine Water Quality Standards pursuant to the provisions of the *Water Classification Program*, 38 M.R.S. Sections 464-468 and to certify attainment of such, with any necessary conditions, under Section 401 of the Federal Water Pollution Control Act (a.k.a. Clean Water Act).

3. **If the requestor is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.**
   Requestor is a resource agency.

4. **Describe existing information concerning the subject of the study proposal, and the need for additional information.**
   The West Branch of the Penobscot River downstream of the Ripogenus dam must meet Maine habitat and aquatic life criteria. Agency file review indicates data is insufficient in the bypass and tailrace reaches of the Ripogenus Project to assess current attainment of these criteria. The PAD indicates that no water quality studies designed to assess the extent of aquatic habitat are planned for the Project; the Department requests that water quality studies for this project include a study of this nature.

5. **Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.**
   Data collected will be used to evaluate aquatic habitat in the West Branch of the Penobscot River downstream of the Ripogenus dam, in the bypass reach and in the project tailrace. Information will be used to evaluate whether the project meets Maine habitat and aquatic life criteria and will inform the water quality certification process.

6. **Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate filed season(s) and duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.**
   The DEP Sampling Protocol for Hydropower Studies (March 2021) was established by Department staff and has been used successfully throughout the State by the DEP and others. A copy of the Department protocol is attached to the PAD comment letter.

7. **Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs.**
A cross-section flow study measures depth, velocity, and wetted width along established transects in the bypass and tailrace reaches at various discharges to determine flows where at least 75% of the stream cross-sectional area has enough water to provide sufficient habitat for fish and other aquatic organisms. This type of study can typically be accomplished in one or two days. Costs are considered reasonable given that this study is required for Maine water quality certification and is routinely completed at hydropower projects being relicensed in the State. No alternatives to this study are proposed.

Maine Department of Environmental Protection
Study Request
Penobscot Mills Hydropower Project (FERC No. 2458)

**Aquatic Habitat Cross-Section Flow Study**

1. **Describe the goals and objectives of each study proposal and the information to the obtained.**
Assessment of aquatic habitat downstream of the Penobscot Mills dams at Millinocket Lake, North Twin Development, Quakish Lake (Stone dam) and Ferguson Pond (powerhouse tailrace in Millinocket Stream), Dolby Development dam and East Millinocket Development dam is required to determine whether current in-stream flow

releases meet Maine habitat and aquatic life criteria. An aquatic habitat cross-section flow study measures depth, velocity, and wetted width along established transects at various discharges to determine flows where at least 75% of the stream cross-sectional area, measured from bankfull width, has enough water to provide sufficient habitat for fish and other aquatic organisms. Data will be evaluated to determine if the downstream waters provide sufficient quantity of water to maintain riverine aquatic habitat in the bypass and tailrace reaches.

2. **If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.**
   The resource management goal is to ensure attainment of Maine Water Quality Standards pursuant to the provisions of the *Water Classification Program*, 38 M.R.S. Sections 464-468 and to certify attainment of such, with any necessary conditions, under Section 401 of the Federal Water Pollution Control Act (a.k.a. Clean Water Act).

3. **If the requestor is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.**
   Requestor is a resource agency.

4. **Describe existing information concerning the subject of the study proposal, and the need for additional information.**
   The West Branch of the Penobscot River and Millinocket Stream downstream of each of the Project dams must meet Maine habitat and aquatic life criteria. Agency file review indicates data is insufficient in the bypass and tailrace reaches of the Penobscot Mills Project, including the original channel of the West Branch of the Penobscot River, also referred to as the Back Channel, to assess attainment of these criteria. The PAD indicates that water quality studies are planned for the Project but does not indicate that an aquatic habitat cross-sectional flow study is planned; the Department requests that such studies include a study of this nature.

5. **Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.**
   Data collected will be used to evaluate aquatic habitat in the West Branch of the Penobscot River, including the reach of the river referred to as the Back Channel, as well as in Millinocket Stream, downstream of each of the project dams. Information will be used to evaluate whether the project meets Maine habitat and aquatic life criteria and will inform the water quality certification process.

6. **Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate filed season(s) and duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.**

The DEP Sampling Protocol for Hydropower Studies (March 2021) was established by Department staff and has been used successfully throughout the State by the DEP and others. A copy of the Department protocol is attached to the PAD comment letter.

7. **Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs.**
A cross-section flow study measures depth, velocity, and wetted width along established transects in the bypass and tailrace reaches at various discharges to determine flows where at least 75% of the stream cross-sectional area has enough water to provide sufficient habitat for fish and other aquatic organisms. This type of study can typically be accomplished in one or two days. Costs are considered reasonable given that this study is required for Maine water quality certification and is routinely completed at hydropower projects being relicensed in the State. No alternatives to this study are proposed.

Maine Department of Environmental Protection
Study Request
Ripogenus Hydropower Project (FERC No. 2572)

**Benthic Macroinvertebrate Study**

1. **Describe the goals and objectives of each study proposal and the information to the obtained.**
Assessment of the benthic macroinvertebrate community is critical to determine whether current in-stream flow releases affect attainment of Maine habitat and aquatic life criteria for Class B and Class A waters in the West Branch of the Penobscot River below the

Ripogenus dam and downstream of the McKay Station powerhouse. The assessment provides biological data to evaluate potential impacts caused by project operations.

2. **If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.**
   The resource management goal is to ensure attainment of Maine Water Quality Standards pursuant to the provisions of the *Water Classification Program*, 38 M.R.S. Sections 464-468 and certify attainment of such, with any necessary conditions, under Section 401 of the Federal Water Pollution Control Act (a.k.a. Clean Water Act)

3. **If the requestor is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.**
   Requestor is a resource agency.

4. **Describe existing information concerning the subject of the study proposal, and the need for additional information.**
   The West Branch of the Penobscot River must meet Maine aquatic life criteria in the vicinity of the Ripogenus Project, both in the bypass reach and downstream of the Project powerhouse. Agency file review indicates data is insufficient to evaluate the current aquatic community in the bypass and tailrace reaches downstream of the Ripogenus dam. The PAD indicates that a study of this nature is planned for the project; sample locations must be determined in consultation with the Department.[14]

5. **Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.**
   Data collected will be used to evaluate the benthic macroinvertebrate community in the bypass and in the tailrace reach downstream of the Ripogenus dam. Information will be used to evaluate whether the project meets Maine aquatic life criteria and will inform the water quality certification process.

6. **Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate filed season(s) and duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.**
   The DEP Methods for Biological Sampling and Analysis of Maine's Rivers and Streams (April 2014) was established by Department staff and has been used successfully throughout the state by DEP and others since 1983. A copy of the Department manual is attached to the PAD comment letter.

[14] The Project PAD indicates that water quality in the West Branch of the Penobscot River is good and meets all applicable water quality standards, however such assertions are based on dated data and may not be representative of current water quality conditions.

7. **Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs.**
Replicate benthic macroinvertebrate sample collectors (rock baskets or cones) are deployed for a 28-day study period in the tailrace reach of the hydropower project during low flow, high temperature conditions. Samples must be collected by a professional aquatic biologist and evaluated by a professional freshwater macroinvertebrate taxonomist. Methods are documented in the DEP manual Methods for Biological Sampling and Analysis of Maine's River and Streams (April 2014). Costs are considered reasonable given that this study is required for Maine water quality certification and is routinely completed at hydropower projects being relicensed in the State. No alternatives to this study are proposed.

Maine Department of Environmental Protection
Study Request
Penobscot Mills Hydropower Project (FERC No. 2458)

**Benthic Macroinvertebrate Study**

1. **Describe the goals and objectives of each study proposal and the information to the obtained.**
Assessment of the benthic macroinvertebrate community is critical to determine whether current in-stream flow releases affect attainment of Maine habitat and aquatic life criteria

for Class A, Class B and Class C waters, as applicable, in Millinocket Stream and in the West Branch of the Penobscot River downstream of the Millinocket Lake Storage Development dam, downstream of the North Twin Development dam, downstream of the Stone dam[15], in Millinocket Stream within the tailrace of the Millinocket Development dam, downstream of the Dolby Development dam and downstream of the East Millinocket Development dam. The assessment provides biological data to evaluate potential impacts caused by project operations.

2. **If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.**
   The resource management goal is to ensure attainment of Maine Water Quality Standards pursuant to the provisions of the *Water Classification Program*, 38 M.R.S. Sections 464-468 and certify attainment of such, with any necessary conditions, under Section 401 of the Federal Water Pollution Control Act (a.k.a. Clean Water Act)

3. **If the requestor is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.**
   Requestor is a resource agency.

4. **Describe existing information concerning the subject of the study proposal, and the need for additional information.**
   Millinocket Stream and the West Branch of the Penobscot River must meet Maine aquatic life criteria downstream of the Project dams (Millinocket Lake Storage Development dam, North Twin Development dam, Millinocket Development am, Dolby Development dam and East Millinocket Development dam, and in the bypass reach (downstream of the Stone dam, also known as the Back Channel). Agency file review indicates data is insufficient to evaluate the current aquatic community in the bypass and tailrace reaches downstream of the Project dams. The PAD indicates that a study of this nature is planned for the project; sample location must be determined in coordination with the Department.

5. **Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.**
   Data collected will be used to evaluate the benthic macroinvertebrate community in Millinocket Stream and in the West Branch of the Penobscot River downstream of each of the Project dams, including downstream of the Stone Dam in the original channel of the West Branch of the Penobscot River, also known as the Back Channel. Information will be used to evaluate whether the project meets Maine aquatic life criteria and will inform the water quality certification process.

6. **Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a**

[15] In the original channel of the West Branch of the Penobscot River, also referred to as the Back Channel.

**schedule including appropriate filed season(s) and duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.**
The DEP Methods for Biological Sampling and Analysis of Maine's Rivers and Streams (April 2014) was established by Department staff and has been used successfully throughout the state by DEP and others since 1983. A copy of the Department manual is attached to the PAD comment letter.

7. **Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs.**
Replicate benthic macroinvertebrate sample collectors (rock baskets or cones) are deployed for a 28-day study period in the tailrace reach of the hydropower project during low flow, high temperature conditions. Samples must be collected by a professional aquatic biologist and evaluated by a professional freshwater macroinvertebrate taxonomist. Methods are documented in the DEP manual Methods for Biological Sampling and Analysis of Maine's River and Streams (April 2014). Costs are considered reasonable given that this study is required for Maine water quality certification and is routinely completed at hydropower projects being relicensed in the State. No alternatives to this study are proposed.

## LAKES, PONDS, AND IMPOUNDMENTS

***Applicability***
This impoundment sampling protocol shall apply to existing hydropower impoundments regardless of their waterbody classification, where existing data are insufficient (in terms of density or quality) to determine water quality.

### Trophic State Study

***Overview & Sampling Stations***
Each basin or station shall be sampled at the deepest location twice each month, at approximately 2-week intervals for at least five consecutive months during one open-water season. Sampling will consist of obtaining physical measurements as well as water samples. Water samples will be obtained using an integrated core sampler that is 10-meters long, and, when water is of adequate depth, a grab device. During August, additional water samples will be obtained. Sampling personnel must be certified for this sampling protocol annually, prior to data collection by DEP's Division of Environmental Assessment, Lake Assessment Section staff. If sampling is inadequate or certification is bypassed, a second open water season of data may be required. Additional sampling may be required due to the hydraulic or physical characteristics of a given waterbody or to the presence of significant water quality problems. Refer to Table 1 for an overview of parameters, frequency, sampling methods and detection/reporting limits.

Table 1. Summary of parameters, frequency, sampling methods and detection/reporting limits for hydropower impoundment sampling.

| Parameter | Frequency | Sampling Method | Detection/Reporting Limits |
|---|---|---|---|
| Secchi disk transparency | 2x/month | disk and water scope | 0.1 meter |
| Temperature | 2x/month | electronic meter (profile) | 0.1 ℃ |
| Dissolved oxygen | 2x/month | electronic meter (profile) | 0.2 mg/l |
| Trichromatic Chlorophyll-a (uncorrected) | 2x/month | core tube | 0.001 mg/L |
| Water Chemistry | 2x/month; additional samples in August | core tube or grab device | See Table 2 below |

***Physical measurements***

Physical measurements will include the determination of water transparency using a Secchi disk and water scope following the Maine Lake Assessment SOP for *Secchi Disk Transparency* (DEPLW0947R2). In addition, profiles for temperature and dissolved oxygen will be taken from the water surface to the bottom of the impoundment. Readings will be obtained, recorded, and submitted on DEP lake monitoring forms. Readings will be obtained in 1-meter increments from the surface to 15 meters in depth, then in 2 meter increments from 15 meters to 25 meters, and every 5 meters in water deeper than 25 meters; if between 15 and 25 meters, a rapid change in temperature or oxygen is discovered, readings will be taken at 1 meter intervals until they stabilize. Refer to the Maine Lake Assessment SOP for obtaining Dissolved Oxygen/Temperature Profiles using electronic meters for additional details (DEPLW0941R2). If a multiparameter device is used that can also measure pH and specific conductance, these data may be substituted for lab data, providing that calibration and quality control check records are maintained and submitted with the data.

***Epilimnetic core samples***

The depth to which an integrated epilimnetic sample will be obtained using a core tube will be determined according to the Maine Lake Assessment SOP for *Epilimnetic Core Sample Collection* (DEPLW0946R2). Water samples collected through the season will be analyzed for uncorrected chlorophyll-a by the trichromatic method, total phosphorus, color, pH and alkalinity. Water samples collected in August will be additionally analyzed for nitrate, TKN, DOC, iron, calcium, magnesium, total and dissolved aluminum, sodium, potassium, silica, specific conductance, chloride, and sulfate. Refer to Table 2 for specific requirements; obtain bottles and preservatives from the analytical lab. In impoundments that do not thermally stratify (no change in temperature greater than or equal to 1℃ per meter below a depth of 2 meters from the water surface), the core sample will be collected to 1 meter above the bottom, unless dissolved oxygen is less than or equal to 2 ppm, in which case the sample should be collected to the meter above that depth.

During warmer times of the year, if the lake is deep enough to stratify, examine the dissolved oxygen / temperature profile to determine the depth of the true seasonal epilimnion using the 1℃ change over 1 meter of depth rule below a depth of 2 meters. Be aware that within the true or seasonal epilimnion, a shallow, secondary ephemeral (temporary) epilimnion can form in the top few meters of water as a result of a few calm, warm days. Take the core sample to 1-meter below the bottom of the true epilimnion so as to include neutrally-buoyant algal growth at the epi/metalimnion interface. Elevated dissolved oxygen lower in the profile may indicate need to extend the core deeper to capture the algae responsible for the oxygen spike. Because Chlorophyll

samples are generally obtained from the core sample, never incorporate any water having 2 ppm of oxygen or less into the sample.

***Grab samples***

During late summer (mid to late August depending on latitude and weather conditions), in stratified lakes, grab samples will be obtained using a Kemmerer, Van Dorn or similar device, according to the Maine Lake Assessment SOP for the *Collection of Grab (discrete) Samples* (DEPLW0949R2). The grab samples will be analyzed for total phosphorus, color, pH, alkalinity, TKN, DOC, iron, calcium, magnesium, total and dissolved aluminum, sodium, potassium, silica, specific conductance, chloride, and sulfate. Refer to Table 2 for additional details.

If the lake does not stratify, no grab samples are needed. Otherwise, the number of grab samples taken is determined by the depth and thermal stratification pattern in the lake. In lakes deep enough to thermally stratify into 3 layers, grabs will be obtained from the metalimnion and hypolimnion. The metalimnetic sample will be taken 1 meter below the depth to which the integrated epilimnetic core sample was taken, and the hypolimnetic sample will be taken a meter above the bottom of the impoundment. In lakes that only stratify thermally into 2 layers, only one grab depth is necessary; in this case the grab sample will be obtained a meter above the bottom of the impoundment.

| Table 2. Summary of water sampling parameters, reporting levels, frequency, and sample types limits for hydropower impoundment sampling. | | | | |
|---|---|---|---|---|
| **Parameter** | **Reporting Level** | **2x per month** | **August** | **Sample types** |
| Trichromatic Chlorophyll a (uncorrected) | 0.001 mg/L | X | X | core |
| Total phosphorus | 0.001 mg/L | X | X | core & grab(s) |
| Nitrate | 0.01 mg/L | X | X | core & grab(s) |
| TKN | 0.01 mg/L | X | X | core & grab(s) |
| Color | 5.0 SPU | X | X | core & grab(s) |
| DOC | 1.0 mg/L | X | X | core & grab(s) |
| pH | 0.1 pH units | X | X | core & grab(s) |
| Total alkalinity | 1.0 mg/L | X | X | core & grab(s) |
| Total iron | 0.05 mg/L | | X | core & grab(s) |
| Total & dissolved aluminum | 0.002 mg/L | | X | core & grab(s) |
| Total calcium | 0.05 mg/L | | X | core & grab(s) |
| Total magnesium | 0.05 mg/L | | X | core & grab(s) |
| Total sodium | 0.05 mg/L | | X | core & grab(s) |
| Total potassium | 0.05 mg/L | | X | core & grab(s) |
| Total silica | 0.05 mg/L | | X | core & grab(s) |
| Specific conductance | 2 µS/cm | | X | core & grab(s) |
| Chloride | 0.5 mg/L | | X | core & grab(s) |
| Sulfate | 1 mg/L | | X | core & grab(s) |

## Habitat Study

For lakes, ponds, and riverine impoundments, determination of attainment of the designated use 'habitat for fish and other aquatic life' will be determined as follows. Using a depth of twice the mean summer Secchi disk transparency, determined from the Trophic State Study or historic DEP data, as the bottom of the littoral zone, the volume and surface area dewatered by the drawdown will be calculated to determine if at least 75% of the littoral zone remains watered at all times. Alternatively, studies of fish and other aquatic life communities, including freshwater mussels, may be conducted to demonstrate that the project maintains 'structure and function of the resident biological community' despite a drawdown that results in less than 75% of the littoral zone remaining watered at all times.

## Fishing (Mercury Contamination) Study

To ensure that the project does not contribute to the Statewide Fish Consumption Advisory due to mercury, projects with excessive drawdowns (generally >10 feet) may be required to analyze sport fish from the project waterbody and one or more reference waters for mercury. Contact DEP for specific requirements for each project.

## RIVERS AND STREAMS

### Temperature and Dissolved Oxygen Study

***Applicability***

This rivers and streams sampling protocol shall apply to tailwater areas that are not impoundments where existing data are insufficient to determine existing and future water quality.

***Sampling Stations***

Sampling shall occur in the tailwater downstream from the turbine/gate outlet or dam at a location representative of downstream flow as agreed by DEP on a case by case basis. Initially, measurements of temperature and dissolved oxygen should be made along a transect across the stream at the first, second and third quarter points across the width. If there is no violation of dissolved oxygen criteria and no significant (<0.4 mg/l) difference in concentrations among the quarter points, subsequent measurements may be made at the location shown to be representative of the main flow. Otherwise, measurements should be made at the location of the lowest concentration and the location of the main flow. Sampling should also occur in any bypassed segment of the river created by the project. Additional sampling stations may be required in the upstream or downstream areas where significant point or nonpoint sources exist or where slow moving or deep water occurs. The number and spacing of any additional stations will be determined by DEP on a case-by-case basis.

***Parameters***

Temperature and dissolved oxygen shall be sampled at mid-depth in rivers less than 2 m deep or in a profile of 1-meter increments of depth in rivers greater than 2 m deep. In rivers where it is already known that attainment of required statutory dissolved oxygen criteria is questionable, sampling for additional parameters (e.g. BOD, nitrogen, phosphorus) may be necessary.

***Frequency and Timing***

Sampling should be conducted during the summer low flow high temperature period, with the ideal conditions being the 7Q10 flow (the 7-day average low flow with a 10-year recurrence interval) combined with daily average water temperatures exceeding 24 $^{O}$C. Measurements of temperature and dissolved oxygen shall be made every hour with a data sonde in remote unattended mode continuously during July and August, unless high flows well above seasonal median flows occur.

Alternatively, with concurrence by DEP, sampling could be undertaken one day per week for a minimum of ten weeks throughout the summer low flow, high temperature period. Each discrete grab sampling event for temperature and dissolved oxygen would consist of a minimum of two daily runs, the first of which should occur before 7 AM and the second of which should occur after 2 PM. Sampling results will not be considered complete unless a minimum of 5 sampling days meets the following conditions: The product of the water temperature ($^{O}$C) and the flow duration (the percentage of the time a given flow is statistically exceeded) at the time of sampling exceeds 1500. For cycling hydropower projects, in addition to twice daily monitoring, continuous monitoring may be required at some locations for a duration equivalent to the period of one cycle of the storage and the release of flow.

For either method, a summer in which low flows and high temperatures are not experienced may result in additional sampling requirements for the next summer. Low flow conditions may occur naturally, as an unregulated river or may be artificially induced, as in the case of upstream flow regulation or flows downstream from a cycling or peaking power project or in the case of a bypassed segment which receives flow only by spillage, leakage or specific releases.

***Available Data***

The use of data already available is encouraged provided that adequate QA/QC procedures have been followed. Old data may not be acceptable for considerations of meeting minimum sampling requirements but could still provide useful information. Acceptance/rejection of data will be determined on a case by case basis, but generally data more than 10 years old may be rejected.

## Habitat and Aquatic Life Studies

For rivers and streams, determination of attainment of the designated use 'habitat for fish and other aquatic life' and "structure and function of the resident biological community" will be determined as follows. A Cross-Section Flow Study is required that measures width and depth at various flows to determine the flow at which at least 75% of the bank full cross-sectional area of the river or stream is continuously watered. At least three cross-sections representative of the river or stream must be measured. Alternately, a combination of ambient measurements in one cross-section, flow data from existing flow gages, and/or modelling may be approved by DEP.

In addition, to determine if the project 'attains the aquatic life criteria, i.e. 'maintains the structure and function of the resident biological community', biological monitoring of the benthic macroinvertebrate community must be conducted following DEP's standard protocol in Methods for Biological Sampling and Analysis of Maine's Rivers and Streams, DEP LW0387-B2002.
A copy can be found at www.maine.gov/dep/water/monitoring/biomonitoring/material.html

# Methods for Biological Sampling and Analysis of Maine's Rivers and Streams

Susan P. Davies
Leonidas Tsomides



DEP LW0387-C2014
Revised April, 2014

# MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

# METHODS

# FOR

# BIOLOGICAL SAMPLING AND ANALYSIS OF

# MAINE'S RIVERS AND STREAMS

**Susan P. Davies**

**Leonidas Tsomides**

Maine Department of Environmental Protection
Bureau of Land and Water Quality
Division of Environmental Assessment
Augusta, Maine 04333
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## FOREWORD

This manual describes the field, laboratory and data preparation methods required by the Maine Department of Environmental Protection to collect and analyze benthic macroinvertebrate samples for the River and Stream Biological Monitoring Program. The biological classification of Maine's inland waters was authorized by the Maine State Legislature with the passage of Public Law 1985 Chapter 698 - The Classification System for Maine Waters. This law states that it is the State's objective "to restore and maintain the chemical, physical and biological integrity" of its waters, and establishes a water quality classification system to enable the State to manage its waters so as to protect their quality. The classification system further establishes minimum standards for each class, which are based on designated uses, and related characteristics of those uses, for each class of water.

Each water quality class contains standards that, among other things, describe the minimum condition of the aquatic life necessary to attain that class. The Maine Department of Environmental Protection (the Department) has developed numeric criteria in support of the narrative aquatic life standards in the Water Quality Classification Law. The Department has collected a large, standardized database consisting of benthic macroinvertebrate samples from above and below all significant licensed discharges in the State, from areas impacted by non-point sources, as well as from relatively unperturbed areas. These sampling locations were chosen to represent the range of water quality conditions in the State. This information has been used to develop numeric criteria which are specific to the natural biotic community potential of the State of Maine (see Davies et al., 1995 and 1999 for a description of the development and application of numeric criteria) and is established in DEP regulation Chapter 579 : Classification Attainment Evaluation Using Biological Criteria for Rivers and Streams.

Standardization of data collection and analytical methods is fundamental to the consistent, unbiased and scientifically sound evaluation of aquatic life impacts. This manual sets forth the standardized practices and procedures used by the Department to acquire or accept benthic macroinvertebrate data for use in regulation, assessment or program development.

Biological Monitoring Unit
Division of Environmental Assessment
Bureau of Land and Water Quality
Maine Department of Environmental Protection
Augusta, Maine 04333
207-287-3901

# I GENERAL METHODS FOR RIVER AND STREAM AQUATIC LIFE CLASSIFICATION ATTAINMENT EVALUATION

Each water quality class is defined by standards that describe the minimum condition of the aquatic community necessary to attain that class. The benthic macroinvertebrate community is used as an indicator community of the general state of the aquatic life in flowing waters for the purpose of assessment of classification attainment. Standardized sampling techniques and sample analysis are required for assessment of biological attainment of stream water quality classification. This manual presents the standard practices and procedures that have been adopted by the Department to acquire benthic macroinvertebrate data for purposes of aquatic life classification attainment evaluation.

Purpose:

To determine the water quality class attained by a particular river or stream reach in terms of the aquatic life standards set forth in 38 MRSA Sec. 465 (The Classification System for Maine Waters).

Requirements:

All samples of aquatic life that are collected for purposes of classification attainment evaluation, whether collected by the Department or by any party required to make collections by the Department, must be collected, processed and identified in conformance with the standardized methods outlined in this manual. Selection of appropriate sampling sites and micro-habitat to sample, as well as procedures for quantitative analysis of the sample must conform to methods set forth in this manual. Data submitted by any party required to make collections by the Department must be accompanied by a Quality Assurance Plan, approved by the Commissioner.

## 1. Qualifications of Sampling Personnel

Biological sampling must be performed by a professional aquatic biologist or by qualified personnel under the supervision of a professional aquatic biologist. The professional aquatic biologist must have, as a minimum, a Bachelor of Science degree in biological sciences with aquatic entomology, invertebrate zoology, fisheries or closely related specialization, and greater than 6 months experience working with macroinvertebrate sampling methods and taxonomy. (See also Qualifications of Laboratory Personnel, Sec. II-1.)

2. Apparatus, Equipment, Supplies, Instruments

(1) Sampling devices

a) Rock-filled wire basket introduced substrate

Use: flowing wadeable, eroded, mineral-based bottom rivers and streams.

Description: cylindrical plastic coated or chrome wire, baskets with at least 1.5 cm spaces between wires, a hinged opening, and secure closure (Klemm, D.J. et al, 1990).

Substrate material: clean, washed, bank-run cobble, graded to uniform diameter range of 3.8 to 7.6 cm (1.5 to 3 inches) in size (#2 roofing stone).

Baskets must be filled to 7.25 +/- 0.5 kg (16 lbs +/-1 lb) of substrate material.

b) Rock-filled mesh bag introduced substrate

Use: small flowing streams, too shallow for rock baskets to be fully submerged.

Description: mesh bags of sufficient size to hold 7.25 +/- 0.5 kg of cobble substrate as described above, with at least 2.54 cm aperture mesh, and secure closures.

c) Closing introduced substrate cone

Use: deep, non-wadeable rivers having sufficient flow to have an eroded, mineral based bottom.

Description: cone shaped wire, or plastic coated wire basket filled with substrate material and closed by means of an inverted, weighted funnel (Courtemanch, 1984).

Substrate material: (see above Rock-filled wire basket substrate material).

(2) Sieves, sieve buckets, nets

Samples are concentrated on sieves having a mesh size between 500 - 600 microns (USA Standard Testing Sieve ASTM-E-11 Specification size No. 30 or No. 35).

(3) Optical equipment

a) Binocular microscope: Magnification range from 10x or less to 30x or greater.

b) Compound microscope: Magnification range from 10x to at least 400x; 100x with oil immersion lens is advisable.

3. Sampling Season, Sampler Exposure Period, Placement and Retrieval

(1) Sampling season

The standard sampling season upon which all macroinvertebrate classification criteria are based is the late summer, low flow period (July 1 to September 30). All baseline data for the biological classification program has been collected during this time period. This period often presents conditions of maximal stress to the biological community due to decreased dilution of pollutional material and increased stream water temperatures. Furthermore, because the composition of the benthic macroinvertebrate community changes with season, due to natural life history features, this period defines a standardized seasonal community.

As noted, the Department's linear discriminant models define biological classification criteria derived from a macroinvertebrate community defined by the specific sampling methods and index season under which they were collected. Samples collected at other times of year may yield valuable water quality related information, however classification attainment may not be assigned solely on the basis of results of the linear discriminant models for these non-standard samples.

(2) Exposure period

Standard methods require that substrate samplers be exposed in the water body for a period of 28 days +/- four days within the above-specified sampling season. However, extended exposure periods may be necessary to allow for adequate colonization in the case of assessments of low velocity or impounded habitats. If such conditions exist a 56 days +/- four days exposure period may be used.

(3) Sampler placement

*Rock Baskets/Bags*

The actual sampler location should be approached so as to avoid any disturbance in, or upstream of, the sampled site. Position baskets in locations of similar habitat characteristics. Orient baskets with the long axis parallel to stream flow. Provide for relocation of baskets by flagging trees in the vicinity and/or by drawing a diagram with appropriate landmarks indicated.

*Cones*

Cone samplers should be marked with individual marker buoys (milk jugs or other suitable float) leaving about 5 extra feet of line to allow for water level changes and to provide for easy retrieval. They should be placed on the substrate with a minimum of disturbance, in an apex-up position, and located in the approximate middle fifty percent of the channel. (Note however, care should be taken not to create an obstruction to boat traffic.) In areas subject to vandalism, or in rivers having extensive macrophyte beds, it may be necessary to attach the sampler lines to a common anchor and thence to one unobtrusive surface float. Retrieval funnels will not properly close when lines are fouled with drifting macrophytes.

(4) Sampler retrieval

*Rock Baskets/ Bags*

Baskets are approached from downstream. Excessive accumulations of macrophytes, algae or debris clinging to the outside of the basket should be carefully removed, taking care to avoid jarring the basket itself. An aquatic net or drift net (mesh size 500 - 600 microns) is positioned against the substrate immediately downstream of the basket which is then quickly lifted into the net. The contents of the basket and all net washings are emptied into a sieve bucket (500 - 600 microns); the basket wires are carefully cleaned first, then rocks are hand washed and inspected and returned to the basket. All sieve bucket contents are placed in sample jars. A small amount of stream water and 95% ethyl alcohol is added to yield an approximately 70% solution of alcohol. Especially dense samples should be re-preserved in the laboratory, with fresh 70% ethyl alcohol. Rock baskets should be thoroughly cleaned and allowed to desiccate prior to re-use.

*Cones*

Cone samplers should be retrieved with the boat anchored directly upstream of the samplers. Once the float is retrieved and removed, the line should be held as vertically as possible while the weighted funnel is released down the line to enclose the cone. Cone and funnel should be retrieved quickly and smoothly from the bottom, and released directly into a sieve bucket or tub. Field processing should then proceed as described above for rock baskets.

4. Site Selection Criteria

Classification criteria apply to a strictly defined sample of the benthic macroinvertebrate community. Habitat type from which the community is obtained is a significant determinant of the make-up of the target community. Benthic macroinvertebrate communities of flowing streams and rivers having a hard, eroded substrate comprise the majority of samples in the baseline data set. This habitat is characteristic of the majority of the river and stream waters of the State. Exceptions to these conditions may require special consideration and the exercise of professional judgment. (Note: See Section III-2. (3) "Classification attainment evaluation of waters subjected to flow regulation" page 13, for procedures relating to the assessment of regulated flow sites.) While it is useful to obtain both an upstream and downstream sample to evaluate the effect of a pollution source, classification attainment evaluation does not require data from a matched reference site in order to arrive at a determination of aquatic life class. Analytical methods for classification attainment evaluation are described in Section III.

(1) Site attributes

a) The area selected should be generally representative of the habitat of the stream reach as a whole;
b) Where there is alternating riffle/pool habitat, the riffle/run is the habitat of choice;
c) A location should be selected where there is a high degree of certainty that the rock basket samples will remain fully submerged even if the water level drops significantly.

(2) Precautions

a) Avoid atypical influences such as bridges, entering culverts, channelized areas such as road crossings, culverts, or obstructions to flow;
b) Avoid bank effects: samplers should be located in the middle 50% of the bank to bank width, or in an area with a flow regime typical of the overall character of the stream segment;
c) Avoid slackwater areas and eddies immediately upstream or downstream of large rocks or debris.

(3) Matching reference and effluent impacted sites

If possible both stream reaches should be viewed prior to selection of sampling sites. Efforts should be made to sample habitats which are comparable in the following characteristics:

a) Water velocity;
b) Substrate composition (i.e., size ranges and proportions of particles making up the substrate);
c) Canopy coverage;
d) Depth;
e) Other upstream influences except the pollution source in question (for example, use caution when one site is just below a lake outfall and the other is not).

(4) Factors to be considered in site selection below point sources

The area of initial dilution of an effluent should be determined by visual observation of the plume pattern; by observations of biotic effects attributable to the plume, if evident (periphyton growth, die-off patterns); and by transects of specific conductance measurements from the outfall, in a downstream direction. The site selected should be in an area where reasonable opportunity for mixing of the effluent has occurred. If a mixing zone has been defined in a license, sampling should occur immediately downstream of it. In cases where the effluent plume channels down one bank for great distances (>1 km), or where localized effluent impact is expected to be severe for a distance beyond the zone of initial dilution, it is advisable to have a sampling site upstream of the source, one or more in the plume, and at least two farther downstream. One downstream site should be located at the point of presumed bank to bank mixing and subsequent sites should be located to assess the extent of impact downstream.

5. Sample Size

The biological community is evaluated on the basis of benthic macroinvertebrates obtained from at least three samplers which yield an average of at least 50 organisms per sampler. Matched upstream and downstream sites must be sampled using identical methods and level of effort, preferably by the same personnel.

Subsampling may be performed on samples if the mean number of organisms in a sampler exceeds 500 and subsampling will yield at least 100 organisms per rock/cone sampler. All samplers in a site should be treated consistently. Subsampling methods are described in Section II-5. Note: Subsampling will

reduce sample richness by an indeterminate amount. This may affect the outcome of linear discriminant analysis. See Section III-2. (2).

6. Physical Habitat Evaluation

A field data sheet (Appendix A) is to be completed at the time of sampler placement. This form records site specific information concerning natural variables that may affect community structure. Items addressed include exact site location (latitude and longitude, narrative description of the mapped location and/or a topographic map with site indicated); substrate composition; canopy coverage; land use and terrain characteristics; water velocity, temperature, dates of exposure and investigator name. The form is to be completed by observation as well as instrument measurement of water velocity, specific conductance, dissolved oxygen, global positioning device, temperature, etc.

## II LABORATORY METHODS

1. Qualifications of Laboratory Personnel

Sample processing and taxonomy in the laboratory must be performed or supervised by a professional freshwater macroinvertebrate taxonomist who is certified by the Society of Freshwater Science in the identification of eastern US taxa. Certification must include Genus level categories, such as Ephemeroptera, Plecoptera and Trichoptera (EPT), General Arthropods and Chironomidae taxa. Taxonomic data will not be accepted without verification that the supervising laboratory taxonomist has been certified in relevant categories.

2. Sample Preservation, Sorting

All sample material collected in the field, as described in Section I, is preserved in 70% ethyl alcohol. Samples are stored in airtight containers until sorted. Sorting of macroinvertebrates from detritus and debris should follow methods described in Appendix B. One out of every ten samples is evaluated by a biologist for sorting completeness.

After sorting, recommended storage for macroinvertebrates is in 70% ethyl alcohol with 5% glycerin, in vials sealed with tightly fitting rubber stoppers.

3. Sample Labeling

All samples are labeled in the field immediately upon collection. The label must include the following information:

Date of sample retrieval
Waterbody
Town or target discharge
Whether above or below the discharge (if applicable)
Replicate number

4. Sample Log Book

In the laboratory, the samples from each sampled site are to be assigned a sample log number, written on all items generated by the sample (e.g., sample vials, slides, records, count sheets, etc.). Log numbers are sequentially recorded in a master log book. The log book shall also contain site identification, date of placement and retrieval, investigator name, sampler type and any comments regarding sampler retrieval or data quality.

5. Subsampling

(1) Methods

If it is determined that a sample should be subsampled (see criteria in Section I-5 Sample Size) methods of Wrona et al, (1982) are followed. These are summarized below:

a) Fit a plastic or glass Imhoff-type settling cone with an aquarium air stone sealed in the bottom and connected to a compressed air supply.

b) Place the sorted macroinvertebrate sample in the cone and fill the apparatus with water to a total volume of one liter.

c) Agitate gently for 2 to 5 minutes with the air stone.

d) Remove 25% of the sample in 5 aliquots with a wide-mouth 50 ml dipper and combine into one sample vial. The dipper should be submerged and withdrawn over a five second interval.

e) Ascertain whether or not the required 100 organisms have been obtained in the subsample.

f) Indicate clearly on the sample label and on the data sheet the fraction of the sample that the subsample represents.

(2) Precautions

a) Especially large or dense organisms such as crayfish, molluscs or caddisflies with stone cases, which do not suspend randomly in the sample, should not be included in the subsample. They should be counted separately.

b) When removing aliquots, the subsampler should be careful to avoid biased capture of organisms in the cone. Avoid watching the cone as the dipper is withdrawn.

This method has been tested by the Department and has been found to randomly distribute the sample. The five separate counts conform to a Poisson series and thus can be combined into one sample (Elliott, 1979).

(3) Chironomidae subsampling

A subsampling plan for Chironomidae shall be approved by the Department. A Department recommended subsampling plan follows the following criteria:

a) For samples having less than 100 midges, all midges will be identified to genus/species level.

b) For samples having 100 to 199 midges, a subsample of one half (0.5) will be removed by randomly selecting the specimens to be identified and identified to genus/species level. Remaining unsampled midges will be examined for unusual or rare specimens, which will be removed and identified to genus/species level separate from the subsample of the sample.

c) For samples having 200 to 499 midges, a subsample of one quarter (0.25) will be removed by randomly selecting the specimens to be identified and identified to genus/species level. Remaining unsampled midges will be examined for unusual or rare specimens, which will be removed and identified to genus/species level separate from the subsample of the sample.

d) For samples having 500 or more midges, midges will be grouped by genus for those for which it is possible to confidently identify them to genus level without mounting. For remaining midges not grouped by genus, a subsample of 100 specimens will be randomly selected and identified to genus/species level. Remaining unsampled midges will be examined for unusual or rare specimens, which will be removed and identified to genus/species level separate from the subsample of the sample.

e) Reporting of the subsample of the sample will be as follows. Numbers reported on the Excel spreadsheet will be converted to reflect the sample total. Any round-off errors between the subsample total and the sample total will be equalized by adding or deducting the difference from the most numerous taxon. If unusual or rare specimens are removed from the sample following the subsample removal, the conversion of the subsample total to a "partial" sample total will be based on the sample total minus the number of unusual or rare specimens. Following this procedure, the number of unusual or rare specimens will be added to the "partial" sample total to bring it back to the sample total.

6. Sample Taxonomy

All taxonomic data submitted to the Department must be accompanied by the name(s) of the individual(s) actually performing the identifications. A list of taxonomic references used, and a reference collection of organisms must also be submitted (see below).

(1) Taxonomic resolution

Macroinvertebrate organisms are identified to genus in all cases where possible. If generic keys are not available or taxonomic expertise is lacking for a taxon it should be identified to the lowest level possible. Identification of organisms to species is highly recommended whenever possible. Although quantitative analysis of benthic macroinvertebrate samples by the Department is based on counts adjusted to the generic level of resolution, species designations are recorded in the Department database and can contribute to the final stage of data analysis, Professional Judgment Evaluation of the model outcome. This is especially important for Class Insecta. Taxonomists submitting data for use by the Department must use current taxonomic references.

(2) Identification of Chironomidae

Specimens of chironomid midges are identified from slide mounts of the cleared head capsule and body parts. Euparol or Berlese mounting medium is recommended for preparation of slides. CMCP-9 is recommended for the preparation of permanent slide mounts of reference material, for voucher specimens or for permanent collections. These slides should be prepared under a fume hood. Instructions for preparation and slide mounting may be found in Wiederholm, (1983). In samples in which a given taxon is represented by a large number of individuals, the identification to genus may be made from slide mounts of a sufficient proportion of the individuals to give a high degree of certainty that they are all the same (10-50% depending on

the distinctiveness of the taxon visible under binocular microscope). A subsampling plan for Chironomidae is described in Section II-5. Each permanent slide mount is to be fully labeled or coded in a manner which positively associates the slide with the sample from which it originated.

(3) Quality control

All organisms and records from any sampling event intended to serve regulatory purposes must be preserved for a period of at least ten years. In the course of identifying taxa collected as part of the Department's biological monitoring program, or in other collection activities, a special reference collection of separate taxa is established. This collection allows subsequent identifications of the same taxon to be confirmed and thus serves to standardize taxonomy for the program.

Each contracted taxonomist, working for the Department or working for anyone submitting data to the Department, will be required to submit a reference collection of taxa identified, as well as a list of the taxonomic references used in the identifications. Organism identifications will be checked against the Department's collection by a Department taxonomist.

## III ANALYTICAL METHODS

In general, it is the responsibility of the Department, or its agents, to conduct sampling for the purpose of making decisions on the attainment of water quality classification. Under certain conditions, sampling may be required of applicants for waste discharge licenses, or applicants requiring Section 401 Water Quality Certification. Sampling may be performed by corporations, businesses, organizations or individuals who can demonstrate their qualifications and ability to carry out the Department's sampling and analytical protocol, described in this manual. Such monitoring will be conducted according to a quality assurance plan provided to the Department and approved by the Commissioner.

Classification attainment evaluation is established in DEP regulation Chapter 579: Classification Attainment Evaluation Using Biological Criteria for Rivers and Streams. Davies et al, 1995 details the conceptual and technical basis for the State’s application of linear discriminant analysis to assess attainment of aquatic life standards. A synopsis of Chapter 579 follows in this section.

1. Minimum Provisions

Properly collected and analyzed samples that fail to achieve the following criteria are unsuitable for further analysis through the numeric criteria statistical models:

- Total Mean Abundance must be at least *50* individuals (average per basket/bag/cone);
- Generic Richness for three replicate basket/bag/cone samplers must be at least *15*.

Samples not attaining these criteria shall be evaluated by Professional Judgment. A determination will be made whether the affected community requires re-sampling or whether the community demonstrates non-attainment of minimum provisions of the aquatic life standards.

2. Aquatic Life Statistical Decision Models

The four statistical decision models consist of linear discriminant functions developed to use quantitative ecological attributes of the macroinvertebrate community (Appendix C-1) to determine the strength of the association of a test community to any of the water quality classes (Appendix D). The coefficients or weights are calculated using a linear optimization algorithm to minimize the distance, in multivariate space, between sites within a class, and to maximize the distance between sites between classes.

(1) Linear discriminant models

The discriminant function has the form:

$$Z = C + W_1X_1 + W_2X_2 + ...W_nX_n$$

Where: Z = discriminant score
C = constant
$W_i$ = the coefficients or weights
$X_i$ = the predictor variable values

Association values are computed, using variable values from a test sample, for each classification using one four-way model and three two-way models. The four-way model uses nine variables pertinent to the evaluation of all classes and provides four initial probabilities that a given site attains one of three classes (A, B, or C), or is in non-attainment (NA) of the minimum criteria for any class. These probabilities have a possible range from 0.0 to 1.0, and are used, after transformation, as variables in each of the three subsequent final decision models. The final decision models (the three, two-way models)

are designed to distinguish between a given class and any higher classes as one group and any lower classes as the other group (i.e., Classes A+B+C vs. NA; Classes A+B vs. Class C+NA; Class A vs. Classes B+C+NA). The equations for the final decision models use the predictor variables relevant to the class being tested (Appendix E). The process of determining attainment class using association values is outlined in Appendix F.

(2) Application of professional judgment

Where there is documented evidence of conditions which could result in uncharacteristic findings, allowances may be made to account for those situations by adjusting the classification attainment decision through use of professional judgment as provided in DEP regulation Chapter 579: Classification Attainment Evaluation Using Biological Criteria for Rivers and Streams. The Department may make adjustments to the classification attainment decision based on analytical, biological, and habitat information or may require that additional monitoring of affected waters be conducted prior to issuing a classification attainment decision.

Professional Judgment may be utilized when conditions are found that are atypical to the derivation of the linear discriminant model. Factors that may allow adjustments to the model outcome include but are not limited to:

a) Habitat factors
- Lake outlets
- Impounded waters
- Substrate characteristics
- Tidal waters

b) Sampling factors
- Disturbed samples
- Unusual taxa assemblages
- Human error in sampling

c) Analytical factors
- Subsample vs. whole sample analysis
- Human error in processing

(3) Classification attainment evaluation of waters subjected to flow regulation

The Maine State Legislature, in 38 MRSA Article 4-A Sec. 464 (9)-(10), *The Water Classification Program*, acknowledges that changes to aquatic life and habitat occur as the result of the impoundment of riverine waters and has modified the standards of waters so affected. The habitat and aquatic life criteria of riverine impounded waters of Class A, Class B or Class C are

deemed to be met if the impoundment attains the standards of Class C (e.g., maintenance of structure and function of the resident biological community). Impoundments managed as Great Ponds must also attain Class C aquatic life standards. If the actual water quality attains any more stringent characteristic or criterion than the Class C standards dictate, then the waterbody must be managed so as to protect those higher characteristics. Class C standards also apply to the *downstream* waters below certain specified riverine impoundments on the Kennebec River and the Saco River (Wyman Dam, Moosehead East Outlet Dam, West Buxton Dam and Skelton Dam) that are classified as A or B. All other waters subjected to flow regulation are managed according to standards of the water quality classification assigned by the Legislature.

(4) Adjustments of a decision

It is the responsibility of the Department to decide if adjustments of a decision should occur. The following adjustments may be made to correct for these conditions:

a) Resample
The Department may require that additional monitoring of the test community be done before a determination of class attainment can be made, based on documented evidence of specific sampling factors that may have influenced the results.

b) Raise the finding
   i. The Department may raise the classification attainment outcome predicted by the model from non-attainment of any class to indeterminate or to attainment of Class C, based on documented evidence of specific conditions, as defined above.

   ii. The Department may raise the classification attainment outcome predicted by the model from attainment in one class to attainment in the next higher class, based on documented evidence of specific conditions, as defined above.

c) Lower the finding
The Department may decide to lower the classification attainment finding, on the basis of documented, substantive evidence that the narrative aquatic life criteria for the assigned class are not met.

d) Determination of non-attainment: minimum provisions not met
Samples having any of the ecological attributes not attaining the minimum provisions, and where there is no evidence of conditions which could result in uncharacteristic findings, as defined above, must be determined to be in non-attainment of the minimum provisions of the aquatic life criteria for any class.

e) Determination of attainment: minimum provisions not met
Where there is evidence of factors that could result in minimum provisions not being met, professional judgment may be used to make a professional finding of attainment of the aquatic life criteria for any class. Such decisions will be provisional until appropriate resampling is carried out.

(5) Sampling procedures do not conform

For classification attainment evaluation of test communities that do not conform to criteria provided in Section I General Methods, or Section III-1, Minimum Provisions, of this manual, and are therefore not suitable to be run through the linear discriminant models, the Department may make an assessment of classification attainment or aquatic life impact in accordance with the following procedures:

a) Approved assessment plan
A quantitative sampling and data analysis plan must be developed in accordance with methods established in the scientific literature on water pollution biology, and shall be approved by the department.

b) Determination of sampling methods
Sampling methods are determined on a site-specific basis, based on habitat conditions of the sampling site, and the season sampled:

i. Soft-bottomed substrates shall, whenever ecologically appropriate and practical, be sampled by core or dredge of known dimension or volume.

ii. The preferred method for sampling hard-bottomed substrates shall be the rock basket/cone/bag as described in Section I-2.

iii. Other methods may be used where ecologically appropriate and practical.

c) Classification attainment decisions
Classification attainment decisions may be based on a determination of the degree to which the sampled site conforms to the narrative aquatic life classification criteria provided in 38 MRSA Section 465 and found in Appendix D. The decision is based on established principles of water pollution biology and must be fully documented.

d) Site-specific impact decisions
Site-specific impact decisions may rely on established methods of analysis of comparative data between a test community and an approved reference community.

e) Determination of detrimental impact
A determination of detrimental impact to aquatic life of a test community without an approved reference community may be made if it can be documented, based on established methods of the interpretation of macroinvertebrate data, and based on established principles of water pollution biology, that the community fails to demonstrate the ecological attributes of its designated class as defined by the narrative aquatic life standards in the water quality classification law.

# Maine DEP Biological Monitoring Unit
# Stream Macroinvertebrate Field Data Sheet



**Log Number** _____ Directions_____ Type of Sample_____
**Station Number**_____ _____ Date Deployed_____
Waterbody_____ _____ Number Deployed_____
River Basin_____ Lat-Long Coordinates (WGS84, meters) Date Retrieved_____
Municipality_____ Latitude_____ Number Retrieved_____
Stream Order_____ Longitude_____ Agency/Collector(s)_____

**1. Land Use** (500 m radius upstream)
☐ Urban ☐ Upland conifer
☐ Cultivated ☐ Swamp hardwood
☐ Pasture ☐ Swamp conifer
☐ Upland hardwood ☐ Marsh

**2. Terrain** (500 m radius upstream)
☐ Flat
☐ Rolling
☐ Hilly
☐ Mountains

**3. Canopy Cover** (upstream view)
☐ Dense (75-100% shaded)
☐ Partly open (25-75% shaded)
☐ Open (0-25% shaded)
(% daily direct sun) _____

**4. Physical Characteristics of Bottom** (estimate % of each component over 12 m stretch of site; total = 100%)
[ ] Bedrock [ ] Rubble (3" – 10") [ ] Sand (<1/8") [ ] Detritus
[ ] Boulders (<10") [ ] Gravel (1/8" – 3") [ ] Silt-clay-muck

**5. Habitat Characteristics** (immediate area)

| | |
|---|---|
| Time _____AM PM | Time _____AM PM |
| Width (m) _____ | Width (m) _____ |
| Depth (cm) _____ | Depth (cm) _____ |
| Flow (cm/s) _____ | Flow (cm/s) _____ |
| Diss. $O_2$ (ppm)_____ | Diss. $O_2$ (ppm)_____ |
| Temp (°C) _____ | Temp (°C) _____ |
| pH _____ | pH _____ |
| SPC (µS/cm) _____ | SPC (µS/cm) _____ |
| TDS (ppm) _____ | TDS (ppm) _____ |

Temperature Probe # _____
☐ deployed ☐ retrieved

**6. Observations** (describe)
Fish_____
Algae_____
Macrophytes_____
Habitat quality_____
Dams/impoundments_____
Discharges_____
Nonpoint stressors _____

**7. Water Samples**
☐ Standard
☐ Metals
☐ Pesticides

Lab Number

**8. Photographs**

**9. Landmarks of Sampler Placement** (illustrate or describe landmarks to be used for relocation)

## Appendix B

### Instructions for Macroinvertebrate Sorters

1. Pick the sample **in small portions** (1-2 TBS of material) at a time.

2. Pick all organisms you can see. If in doubt it's usually best to include it.

3. Some types of samples can be easily floated by adding a saturated solution of Epsom salt or sugar to the water. Maintain the saturated solution for the lab by adding enough salt or sugar to water to maintain a thick layer of crystals on the bottom of the storage jar. Use the supernatant solution for picking. Large numbers of organisms can be removed with a sieve spoon from the water surface. After the floaters have been removed, proceed to pick the rest of the sample as usual. A significant portion of the sample will not float and must be picked out with forceps.

4. The sample can be considered done when a careful 45 second search, after swirling the sample, yields no further organisms.

5. The samples are picked in water but should not remain unpreserved for more than 8 hours. Be certain that the final sample vial is preserved with 70% alcohol and 5% glycerin solution when done.

6. Return the detrital material to the original sample jar and preserve with 70% alcohol.

7. Write on the sample jar label "Picked X1 (your initials)".

8. Include in the vial of organisms a slip of index card label in hard pencil (No. 2) including **all information appearing on the original jar label**:

   Log Number — River
   Date - month/day/year — Location (Town or industry name)
   whether above or below
   Basket or Cone number
   Vial number if more than 1 vial is needed per basket

   ex. Log 621 Sandy R. 9/5/97
   Below Farmington (disturbed)
   Basket 2 vial #1 of 2

9. Complete all samples from one log number before beginning a new log number.

10. Keep a record of samples picked including log number

    Basket number — Time spent per basket
    Your name — Date

## Appendix C-1

### Methods for the Calculation of Indices and Measures of Community Structure Used in the Linear Discriminant Models

Variable Number

1 **Total Mean Abundance**

Count all individuals in all replicate samples from one site and divide by the number of replicates to yield mean number of individuals per sample.

2 **Generic Richness**

Count the number of different genera found in all replicates from one site.

Counting rules for Generic Richness:

a) All population counts at the species level will be aggregated to the generic level.

b) A family level identification which includes no more than one taxon identified to the generic level is counted as a separate taxon in generic richness counts.

c) A family level identification with more than one taxon identified to generic level is not counted towards generic richness. Counts are to be divided proportionately among the genera that are present.

d) Higher level taxonomic identifications (Phylum, Class, Order) are not counted toward generic richness unless they are the only representative.

e) Pupae are ignored in all calculations.

3 **Plecoptera Mean Abundance**

Count all individuals from the order Plecoptera in all replicate samplers from one site and divide by the number of replicates to yield mean number of Plecopteran individuals per sampler.

4 **Ephemeroptera Mean Abundance**

Count all individuals from the order Ephemeroptera in all replicate samplers from one site and divide by the number of replicates to yield mean number of Ephemeropteran individuals per sampler.

5 **Shannon-Wiener Generic Diversity (Shannon and Weaver, 1963)**

After adjusting all counts to genus following counting rules in Variable 2:

$$\bar{d} = \frac{c}{N}\left(N \log_{10} N - \sum n_i \log_{10} n_i\right)$$

where: $\bar{d}$ = Shannon-Wiener Diversity
c = 3.321928 (converts base 10 log to base 2)
N = Total abundance of individuals
$n_i$ = Total abundance of individuals in the $i^{th}$ taxon

6 **Hilsenhoff Biotic Index (Hilsenhoff, 1987)**

$$HBI = \sum \frac{n_i a_i}{N}$$

where: HBI = Hilsenhoff Biotic Index
$n_i$ = number of individuals in the $i^{th}$ taxon
$a_i$ = tolerance value assigned to that taxon
N = total number of individuals in sample with tolerance values.

7 **Relative Chironomidae Abundance**

Calculate the mean number of individuals of the family Chironomidae, following counting rules in Variable 4, and divide by total mean abundance (Variable 1).

8 **Relative Diptera Richness**

Count the number of different genera from the Order Diptera, following counting rules in Variable 2, and divide by generic richness (Variable 2).

9 ***Hydropsyche* Mean Abundance**

Count all individuals from the genus *Hydropsyche* in all replicate samplers from one site, and divide by the number of replicates to yield mean number of *Hydropsyche* individuals per sampler.

10 **Probability (A + B + C) from First Stage Model**

Sum of probabilities for Classes A, B, and C from First Stage Model.

11 ***Cheumatopsyche* Mean Abundance**

Count all individuals from the genus *Cheumatopsyche* in all replicate samplers from one site and divide by the number of replicates to yield mean number of *Cheumatopsyche* individuals per sampler.

12 **EPT - Diptera Richness Ratio**

EPT Generic Richness (Variable 19) divided by the number of genera from the order Diptera, following counting rules in Variable 2. If the number of genera of Diptera in the sample is 0, a value of 1 is assigned to the denominator.

13 **Relative Oligochaeta Abundance**

Calculate the mean number of individuals from the Order Oligochaeta, following counting rules in Variable 4, and divide by total mean abundance (Variable 1).

14 **Probability (A + B) from First Stage Model**

Sum of probabilities for Classes A and B from First Stage Model.

15 **Perlidae Mean Abundance (Family Functional Group)**

Count all individuals from the family Perlidae (Appendix C-3) in all replicate samplers from one site and divide by the number of replicates to yield mean number of Perlidae per sampler.

16 **Tanypodinae Mean Abundance (Family Functional Group)**

Count all individuals from the subfamily Tanypodinae (Appendix C-3) in all replicate samplers from one site and divide by the number of replicates to yield mean number of Tanypodinae per sampler.

17 **Chironomini Mean Abundance (Family Functional Group)**

Count all individuals from the tribe Chironomini (Appendix C-3) in all replicate samplers from one site and divide by the number of replicates to yield mean number of Chironomini per sampler.

18 **Relative Ephemeroptera Abundance**

Variable 4 divided by Variable 1.

19 **EPT Generic Richness**

Count the number of different genera from the Order Ephemeroptera (E), Plecoptera (P), and Trichoptera (T) in all replicate samplers, according to counting rules in Variable 2, generic richness.

20 **Variable Reserved**

21 **Sum of Mean Abundances of**: ***Dicrotendipes, Micropsectra, Parachironomus* and *Helobdella***

Sum the abundance of the 4 genera and divide by the number of replicates (as performed in Variable 4).

22 **Probability of Class A from First Stage Model**

Probability of Class A from First Stage Model.

23 **Relative Plecoptera Richness**

Count number of genera of Order Plecoptera, following counting rules in Variable 2, and divide by generic richness (Variable 2).

24 **Variable Reserved**

25 **Sum of Mean Abundances of *Cheumatopsyche, Cricotopus, Tanytarsus* and *Ablabesmyia***

Sum the number of individuals in each genus in all replicate samplers and divide by the number of replicates (as performed in Variable 4).

26 **Sum of Mean Abundances of *Acroneuria* and *Stenonema***

Sum the number of individuals in each genus in all replicate samplers and divide by the number of replicates (as performed in Variable 4).

27 **Variable Reserved**

28 **Ratio of EP Generic Richness**

Count the number of different genera from the order Ephemeroptera (E), and Plecoptera (P) in all replicate samplers, following counting rules in Variable 2, and divide by 14 (maximum expected for Class A).

29 **Variable Reserved**

30 **Ratio of Class A Indicator Taxa**

Count the number of Class A indicator taxa as listed in Appendix C-2 that are present in the community and divide by 7 (total possible number).

## Appendix C-2

### Indicator Taxa: Class A

*Brachycentrus* (Trichoptera: Brachycentridae)
*Serratella* (Ephemeroptera: Ephemerellidae)
*Leucrocuta* (Ephemeroptera: Heptageniidae)
*Glossosoma* (Trichoptera: Glossosomatidae)
*Paragnetina* (Plecoptera: Perlidae)
*Eurylophella* (Ephemeroptera: Ephemerellidae)
*Psilotreta* (Trichoptera: Odontoceridae)

## Appendix C-3

### Family Functional Groups

PLECOPTERA

Perlidae
*Acroneuria*
*Attaneuria*
*Beloneuria*
*Eccoptura*
*Perlesta*
*Perlinella*
*Neoperla*
*Paragnetina*
*Agnetina*

CHIRONOMIDAE

Tanypodinae
*Ablabesmyia*
*Clinotanypus*
*Coelotanypus*
*Conchapelopia*
*Djalmabatista*
*Guttipelopia*
*Hudsonimyia*
*Labrundinia*
*Larsia*
*Meropelopia*
*Natarsia*
*Nilotanypus*
*Paramerina*
*Pentaneura*
*Procladius*
*Psectrotanypus*
*Rheopelopia*
*Tanypus*
*Telopelopia*
*Thienemannimyia*
*Trissopelopia*
*Zavrelimyia*

## Appendix C-3

### Family Functional Group (continued)

Chironomini
*Pseudochironomus*
*Axarus*
*Chironomus*
*Cladopelma*
*Cryptochironomus*
*Cryptotendipes*
*Demicryptochironomus*
*Dicrotendipes*
*Einfeldia*
*Endochironomus*
*Glyptotendipes*
*Goeldichironomus*
*Harnischia*
*Kiefferulus*
*Lauterborniella*
*Microchironomus*
*Microtendipes*
*Nilothauma*
*Pagastiella*
*Parachironomus*
*Paracladopelma*
*Paralauterborniella*
*Paratendipes*
*Phaenopsectra*
*Polypedilum*
*Robackia*
*Stelechomyia*
*Stenochironomus*
*Stictochironomus*
*Tribelos*
*Xenochironomus*

## Appendix D

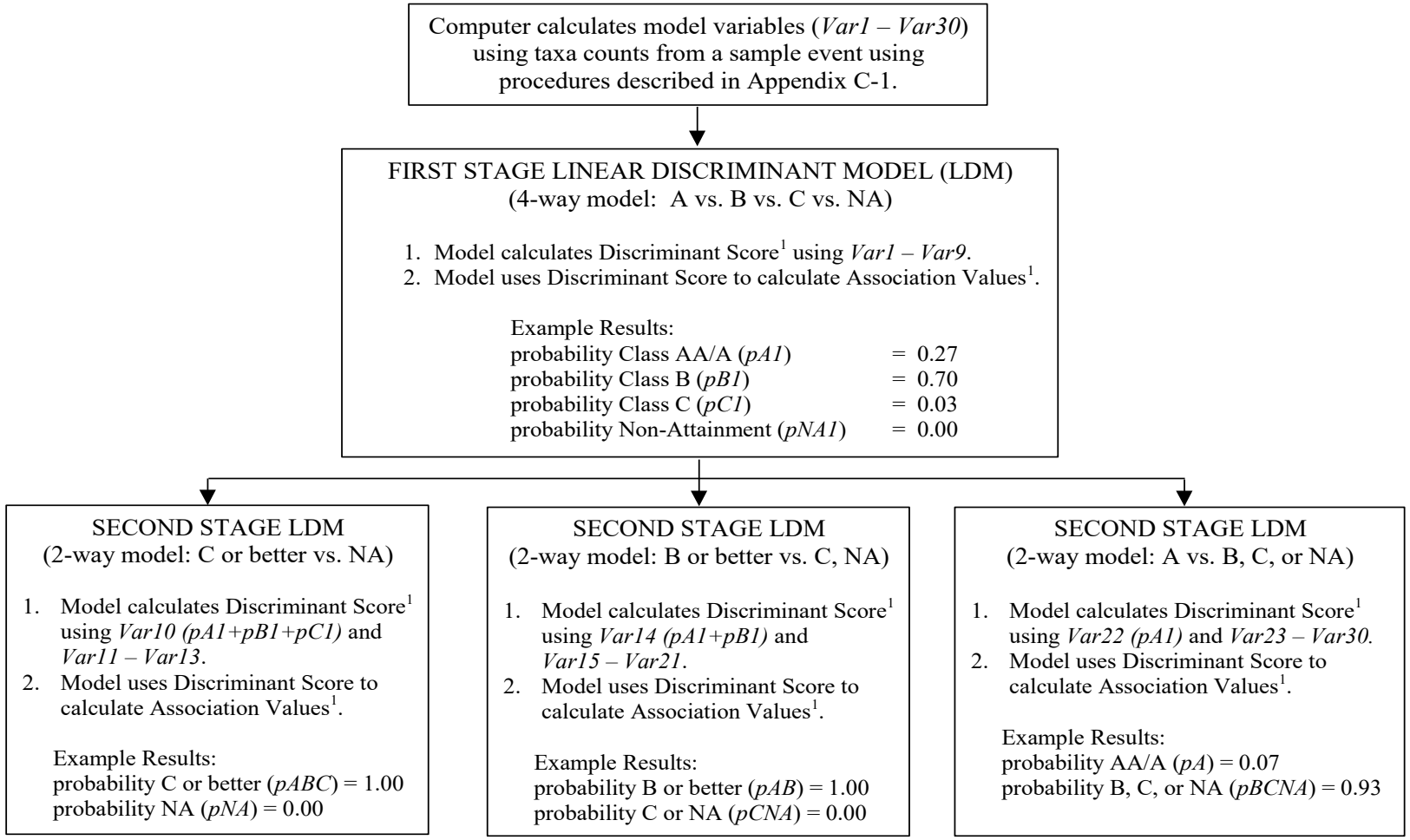
### MRSA 38, 4-A Sec 464-465

### Aquatic Life Standards for the State of Maine

| Classification | Biological Standards |
|---|---|
| AA | No direct discharge of pollutants; aquatic life shall be as naturally occurs. |
| A | Natural habitat for aquatic life; aquatic life shall be as naturally occurs. |
| B | Unimpaired habitat for aquatic life; discharges shall not cause adverse impact to aquatic life in that the receiving waters shall be of sufficient quality to support all aquatic species indigenous to the receiving water without detrimental changes in the resident biological community. |
| C | Habitat for aquatic life; discharges may cause some changes to aquatic life, provided that the receiving waters shall be of sufficient quality to support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community. |

## Appendix E

### Process of Calculating Model Variables and Association Values Using Linear Discriminant Models

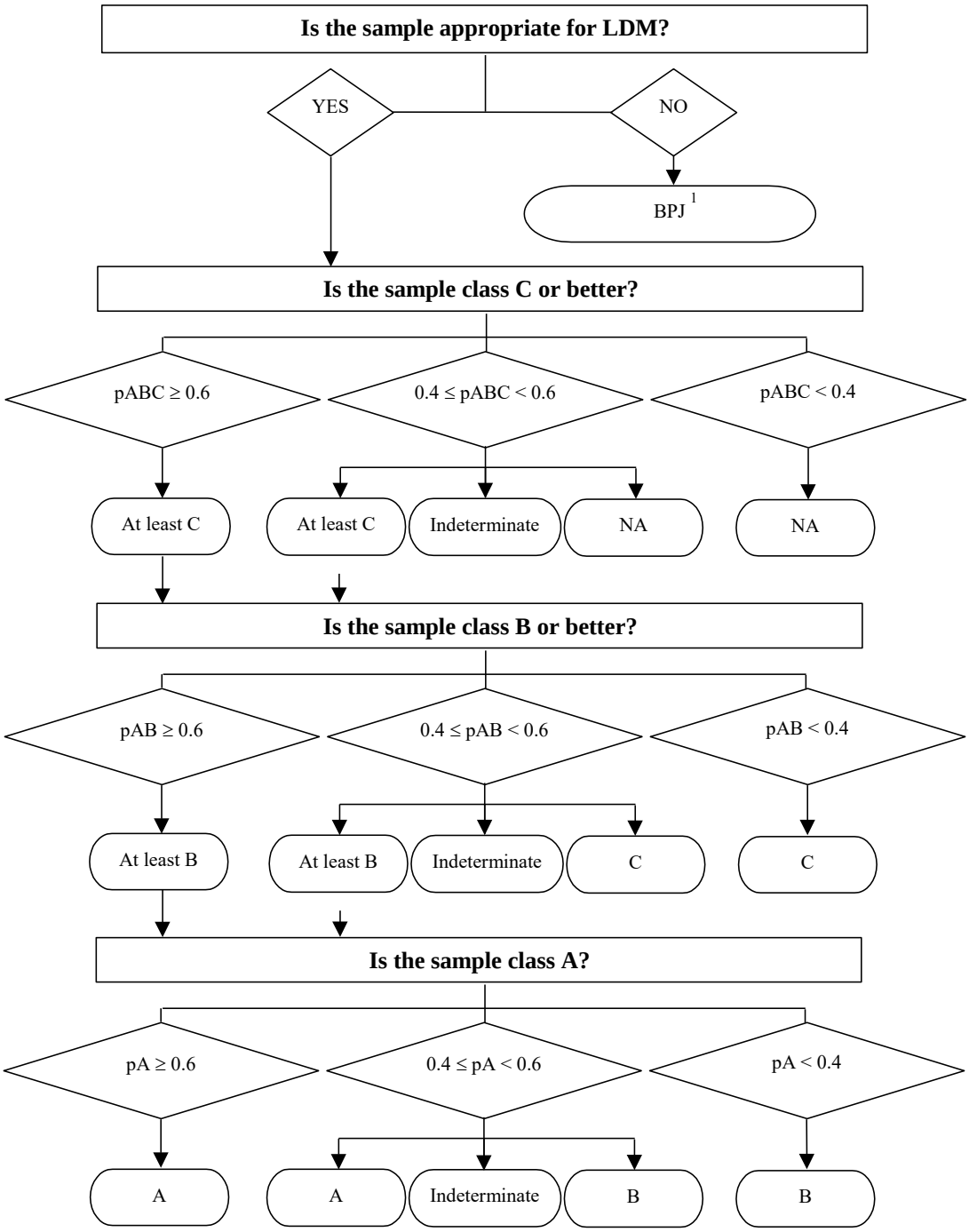



[1] Discriminant Score and Association Values are defined in Section III-2.(1).

*Chart by Thomas J. Danielson*

## Appendix F

### Process for Determining Attainment Class Using Association Values




[1] Best Professional Judgment (BPJ) is defined in Section III-2. (2), (4), and (5)

*Chart by Thomas J. Danielson*

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JANET T. MILLS
GOVERNOR

STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
284 STATE STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041

JUDITH CAMUSO
COMMISSIONER

***VIA ELECTRONIC FILING***

October 8, 2021

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Division
888 First Street, N.E.
Washington, D.C. 20426

**Re: MDIFW Comments and Study Requests for the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458)**

Dear Secretary Bose:

On June 11, 2021, Great Lakes Hydro America, LLC (GLHA), a subsidiary of Brookfield Renewable (Brookfield, Licensee), submitted Notices of Intent (NOI) to file an application for new licenses and a Pre-Application Document (PAD) for both the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458). Subsequently, FERC issued its Notice of Intend to File License Applications, Filing of Pre-Application Document, Commencement of Pre-Filing Process, and Scoping; Request for Comments on the PAD and Scoping Document, Identification of Issues and Associated Study Requests, and Virtual Public Scoping Meeting and Virtual Environmental Site Review for the Projects on August 10, 2021. Both Projects are located on the West Branch of the Penobscot River and span both Piscataquis and Penobscot Counties, Maine. The Maine Department of Inland Fisheries and Wildlife (MDIFW) is a cabinet-level agency of the State of Maine, and under Maine State Law (12 MRSA, §10051) MDIFW's mandate is "*…to preserve, protect, and enhance the inland fisheries and wildlife resources of the State; to encourage the wise use of these resources; to ensure coordinated planning for the future use and preservation of these resources; and to provide for effective management of these resources.*" Based on our statutory responsibility we have prepared the following comments on the PAD and SD1, and are submitting appropriate Study Requests:

## General Wildlife Comments

### *Endangered, Threatened, and Special Concern Species*

Bats

Of the eight species of bats that occur in Maine, the three Myotis species are afforded special protection under Maine's Endangered Species Act (MESA, 12 M.R.S §12801 et. seq.): little brown bat (State Endangered), northern long-eared bat (State Endangered), and eastern small-footed bat (State Threatened). The five remaining bat species are designated as Species of Special Concern: big brown bat, red bat, hoary bat, silver-haired bat, and tri-colored bat. While a

comprehensive statewide inventory for bats has not been completed, based on historical evidence it is likely that several of these species occur within the Project areas during migration and/or the breeding season, as indicated in the PAD. We defer to any comments of the US Fish and Wildlife Service.

Wood Turtle

Wood turtles, a State Species of Special Concern, have been documented in the vicinity of each Project, including in the West Branch of the Penobscot near River Pond and in Sandy Stream, immediately upstream of Millinocket Lake. One roadkill individual was discovered along Route 11 between Elbow and Quakish Lakes. Several verified reports of wood turtles exist from Russell Stream and the West Branch upstream of the Ripogenus impoundment; cursory desktop analyses of aerial imagery indicate that suitable wood turtle habitat is present elsewhere in the Project area. Other than an MDIFW established study site in Sandy Stream, to our Agency's knowledge no formal surveys have been conducted at either Project.

Bigmouth Pondsnail

The bigmouth pondsnail (***Stagnicola mighelsi***), a State Species of Special Concern, is known from Millinocket Lake, as well as a handful of other lakes in Maine. Little is known of this rare species in Maine except that almost all of the lakes where this rare species occurs are large, oligotrophic, and unimpounded.

Golden Eagle

Pursuant to MESA, Golden eagles (both residents and visitors) have been designated as an Endangered Species in Maine since 1986. While our Agency does not anticipate impacts to this species from Project operations, we also do not encourage winter feeding (placement of carcasses on the ice) anymore given the prevalence of lead exposure to scavenging eagles in the winter.

Rare Freshwater Mussels

As stated in the PAD, rare freshwater mussels that have been documented in the Project areas include the yellow lampmussel (State Threatened) and tidewater mucket (State Threatened). In addition, the brook floater (***Alasmidonta varicosa***), a State Threatened species, is likely in the Project area. All three species have experienced declines and extirpations throughout their ranges, and are listed as endangered, threatened, or special concern in most states where they still occur. Freshwater mussels are especially vulnerable to impacts from pollution, sedimentation, dams, and surrounding land use practices that degrade or alter aquatic habitat. It should be noted that the creeper (***Strophitus undulatus***) is no longer listed as Special Concern in Maine but remains a Species of Greatest Conservation Need.

Pygmy Snaketail

The pygmy snaketail (***Ophiogomphus howei***), a Special Concern species of dragonfly, has been documented in the West Branch downstream of the Ripogenus Project. This is one of the State's

rarest dragonflies, listed as Special Concern due to low population numbers and sensitivity to aquatic and riparian habitat degradation.

MDIFW databases do not indicate the presence of other State-listed Endangered, Threatened, or Special Concern Species in Project area; however, to our knowledge no formal surveys have been conducted. It is possible that other rare species may be resident or transient in the Project areas based on location, habitats present, and life history requirements, including one or more rare species of migratory birds during spring and fall migrations. Therefore, the list above should not be considered all-inclusive.

***Other Wildlife Resources of Concern***

Bald Eagle

Bald Eagles are no longer considered a State Special Concern species, although they continue to be protected under the federal Bald Eagle and Golden Eagle Protection Act as well as other federal laws. Similar to golden eagles, while our Agency does not anticipate impacts to this species from Project operations, we also do not encourage winter feeding (placement of carcasses on the ice) anymore given the prevalence of lead exposure to scavenging eagles in the winter. MDIFW defers to any comments of the US Fish and Wildlife Service.

Inland Waterfowl and Wading Bird Habitats

Both Project impoundments contain multiple Inland Waterfowl and Wading Bird Habitats (IWWH), which are considered Significant Wildlife Habitat under Maine's Natural Resources Protection Act. These habitats provide important breeding, feeding, migration, staging, and wintering habitat for waterfowl and wading bird species. Both high and moderate value IWWHs include the wetland complex and a 250-foot upland zone.

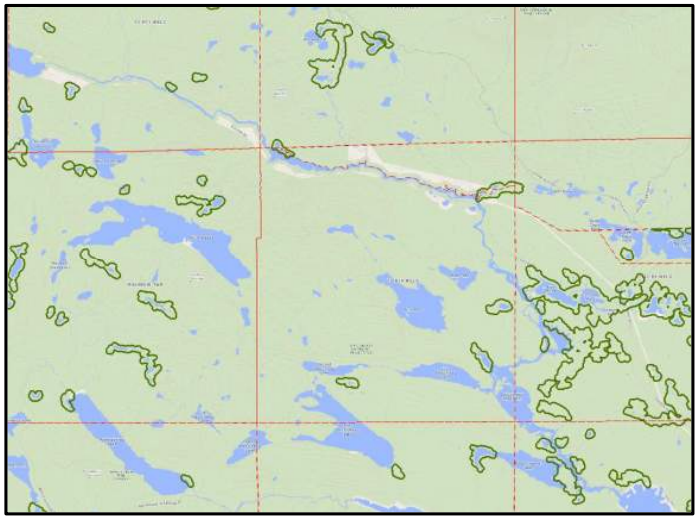
To enhance wetlands at Umbazooksus Lake, the Licensee discontinued storage and release operations in the Spring of 1998 by maintaining the outlet gate in a permanently opened position, resulting in a run-of-river regime, which has resulted in an increase of vegetation density increased over 350%, and that the total extent of vegetated wetlands has increased by ~117 acres since 1998.

It is unknown what impacts, if any, Project operations have on any of the remaining IWWHs at the Ripogenus and Penobscot Mills impoundments, as well as the productivity of breeding waterbirds utilizing these habitats, especially during the low water years, most recently 2020 and 2021. It is also unknown what impacts, if any, are occurring at IWWHs associated with the West Branch of the Penobscot River downstream of McKay Station resulting from Project operations.

**IWWHs (green polygons) associated with the Ripogenus Project**



**IWWHs (green polygons) associated with the West Branch between the Ripogenus and Penobscot Mills Projects**



**IWWHs (green polygons) associated with the Penobscot Mills Project**



**Specific PAD Comments (Wildlife)**

**Page 5-134**: *"Of the seven species found in the Project areas, the creeper, tidewater mucket and the yellow lampmussel are the rarest, with the tidewater mucket and yellow lampmussel state - listed as threatened. The creeper is a state species of special concern."*

MDIFW comments: The creeper is no longer listed as Special Concern in Maine. However, this list should include the State Threatened brook floater which is also likely to be present in the Project area. The brook floater, which is found only in streams and rivers, has not yet been documented within the Project areas but occurs throughout the Penobscot River mainstem and some of its tributaries. The closest documented occurrence for this species is at the confluence of the East and West Branch of the Penobscot River in Medway. Its host fishes (and suspected host fishes) include longnose dace, blacknose dace, golden shiner, pumpkinseed sunfish, slimy sculpin, yellow perch, brook trout, and margined madtom.

*"The yellow lampmussel has been found in the West Branch, Dolby Pond, Millinocket Stream, Pemadumcook Chain Lakes, Millinocket Lake, Passamagamet Lake, Upper, Middle and Lower Jo-Mary Lake, First and Third Debsconeag Lake, and Debsconeag Deadwater (Swartz 2007). Its host fishes (and suspected host fishes*) include white perch, yellow perch, largemouth bass, banded killifish*, chain pickerel*, white sucker*, and smallmouth bass*. The tidewater mucket has been found in Dolby Pond, Millinocket Lake, Passamagamet Lake, and Lower Jo-Mary Lake. Its host fishes (and suspected host fishes*) include the white perch, banded killifish* and alewife*(Swartz and Nedeau 2007)."*

MDIFW comments: The tidewater mucket has also been documented in the West Branch of the Penobscot River. It should also be noted that this species likely occurs throughout all the same waterbodies listed for yellow lampmussel as the two species prefer similar habitat and are often found together.

*"Both the yellow lampmussel and tidewater mucket have been declining throughout their range, prompting many states to list them as endangered or threatened species. In Maine, occurrences of these species are often limited and fragmented in distribution (Swartz and Nedeau 2007)."*

MDIFW comments: This should be changed to "*All three species have been declining…*"

**Page 5-137, Table 5.4-13:** Column heading Status, "Common" should be changed to "Not Listed". The status for creeper should be changed to "Not Listed" (see above); change "No" to "Yes" for Eastern Pearlshell.

**Page 5-157:** The first sentence, "*There are no MDIFW vernal pools or Significant Vernal Pools (SVP) mapped within the approximate boundaries of the Projects according to the MDIFW's Wildlife Habitat Data Web Mapping* Application (MDIFW 2021d)." This should be clarified to state that a comprehensive statewide inventory for Significant Vernal Pools has not been completed, and that none have been conducted in the Project area (to our knowledge).

**Page 5-192:** In the first paragraph, "*Additionally, three state-threatened aquatic species (brook floater, yellow lampmussel, and tidewater mucket) and one aquatic species of special concern (wood turtle) may occur in the vicinity of the Penobscot Mills Project as their known distribution overlaps with the Project area (Table 5.7-1).*" The wording should be corrected as each of these species, as well as the bigmouth pondsnail (Special Concern) do occur in the Project area.

**General Fisheries Comments**

***Ripogenus Project***

Regarding the Ripogenus Project, MDIFW concurs with the Licensee that there is an extensive history of inland fisheries studies associated with the Ripogenus Project completed in preparation for the 1996 license, and these studies need not be duplicated unless there are identified data gaps, or changes in operation that may impact the fisheries resources. We view this upcoming relicensing process as an opportunity to review and fine tune the water management for the Ripogenus Project.

The inland fisheries management goals for the Ripogenus impoundment and river have not changed since the last license was approved; however, there has been a significant change in the quality of the landlocked salmon fishery in both locations. The decline in salmon growth is related primarily to a surplus of salmon in the impoundment and resulting lack of smelt, the primary forage fish. MDIFW has made several changes in fishing regulations to rectify the situation, including new regulations that liberalize length and bag limits to increase harvest. The success of these management strategies is reliant on angler participation. To enhance harvest, we must increase angler use on the lake in the summer and winter. The lack of smelt in the lake has also caused a decline in smelt drift (entrainment) into the river below Ripogenus Dam. It has been well-documented that the smelt drift in the river is important to salmon growth for the riverine population. It should also be noted that the MDIFW no longer manages the lake for lake trout.

In Section 3.1.3 (pg. 20) of the Scoping Document for the Ripogenus Project, it states that "*During normal operation and normal inflow years, the Ripogenus impoundment elevation is held relatively stable at 941.6 feet during the summer months and is gradually drawn down starting in the fall, with a target low elevation of 913.6 feet by late winter, in anticipation of spring thaw and high flows.*"

MDIFW would like to have a more complete understanding of the term "relatively stable". There has been increasing concern that low impoundment elevations are occurring on a more frequent basis. MDIFW understands that 2020 and 2021 were drought years in the Penobscot drainage and these were not "normal inflow years"; however, the resulting low impoundment elevations were ***severe*** compared to other waters in the drainage and in other nearby drainages. The low water made angler access difficult, if not impossible, at several Brookfield water access sites. The lack of angler use hinders our management of the salmon fishery.

In the development of the Water Use Plan (WUP) for the current license, there was discussion of a new rule curve. This rule curve was developed using the total available storage above Ripogenus Dam and was presented in Volume VII of the relicensing documents and is attached below as the "revised elevation". MDIFW requests Brookfield provide the lake elevations individually, by year, superimposed on their rule curve developed for the current WUP for the years 1996 to present so we can determine the extent and frequency of low water conditions in the impoundment.

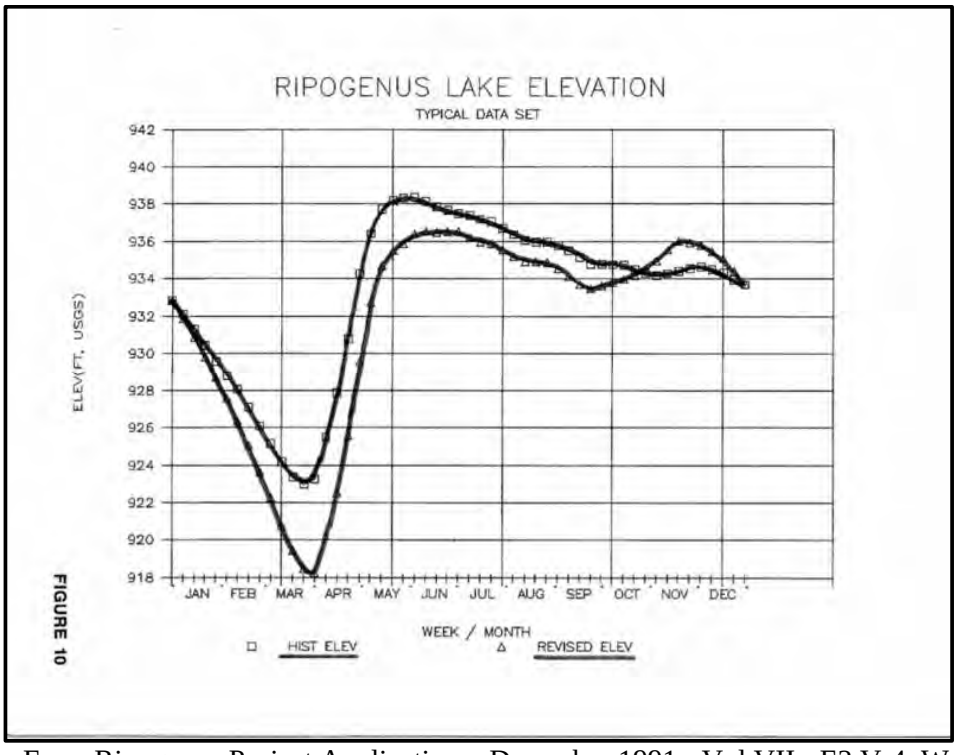



Figure 1: From Ripogenus Project Application – December 1991 - Vol VII - E2 V-4. Water Use Plan

MDIFW is concerned with the low water conditions that persisted in 2020 and 2021, and possibly other years. It has made boating access difficult for the anglers, camp owners, and the general public. It has dewatered large areas of the lake, perhaps the entire littoral zone in both 2020 and 2021, as the lake was down nearly 20 feet during the growing season. We recognize the current license has no restrictions on lake elevations and we are not implying any wrongdoing on the part of the Licensee. We view this as an opportunity to refine the current operation and perhaps minimize the unintended impacts during drought conditions.



Figure 2: Boat launch at Allagash Gateway Campground - August 2021. Note the grass growing at the end of the concrete ramp after successive years of low water. This is supposed to be the "deep water" access to the impoundment. This ramp is inoperable at lake elevations exceeding ~7 ft below full pond.




Figure 3: Parking area with sign at Caribou launch - August 2021.



Figure 4: Launch area at Caribou Lake – August 2021. For perspective, the photographer was standing at what would be the edge of the full pond water level.

Summer drawdowns greater than 10 feet expose large areas of littoral zone around the Ripogenus impoundment and could reduce the abundance and diversity of macroinvertebrates available as forage for the fish populations. Therefore, we are requesting the Licensee repeat the previous studies on macroinvertebrates in the littoral zone of the impoundment to determine if any changes have occurred.

Extreme drought conditions persisted in the summer and fall of 2020. There was a large rain event in late December of 2020 which removed the early snowpack and provided significant inflow. The remainder of the winter was dry with little snow accumulation, and it was apparent by mid-February that the drought would continue and impact the water levels in the spring of 2021. There were concerns even in these driest of years that the Licensee ran flows in excess of the required minimum flows. MDIFW observed on several occasions in the winter and summer of 2021 that the Licensee was indeed running in excess of 3,000 cfs when lower flows were required by the license; however, we do not know the frequency of these occurrences and whether they were necessary for downstream needs, and/or whether they significantly impacted lake elevations in the Ripogenus impoundment.

Peaking power operations were not discussed in the WUP for the current license and were not anticipated. The literature is replete with examples of the detrimental impacts on the riverine fisheries and aquatic communities from rapid changes in flow. Flow changes of less than 25% per hour (ramping rate) can mitigate impacts from peaking power. As noted, we are requesting flow records to evaluate the frequency of flow changes that exceed 25% (see below). We have received anecdotal reports from anglers on the West Branch that insect hatches are less frequent and less intense than in the past. We think it would be prudent if the Licensee repeated the macroinvertebrate studies completed in the river for the current license to determine if any changes have occurred.

MDIFW recognizes that entrainment occurs at Ripogenus Dam/McKay Station. We also acknowledge that any turbine-related mortalities or fish trapped in the intake do not compromise our fishery management objectives for the West Branch or the Ripogenus impoundment. In fact, smelt drift through the dam and power station is essential to maintain salmon growth in the river. Any attempts to reduce entrainment for other species could impact smelt drift and adversely influence our management plans for the river.

***Fish Passage/Invasive Species Discussion***

MDIFW is not requesting any changes to fish passage in either the Ripogenus Project or the Penobscot Mills Project. That said, MDIFW routinely considers the potential to increase the distribution of invasive fish in reviewing dam relicensing projects in Maine. Invasive fish are a serious threat to Maine's' wild and native fisheries. Once established, there are few options to mitigate or eliminate the resulting impacts, with consequences that permanently affect the ecosystem.

Both the State of Maine and the Federal government recognize the gravity of invasive species. The Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 was adopted primarily to prevent and control infestations of Zebra mussels in the Great Lakes. The act was expanded to include preventative measures for all invasive species. As part of this Act, states were directed to develop state-specific invasive species plans with input from the public.

In the 2002, the State of Maine developed an action plan for dealing with invasive species, including fish. The plan states in part:

> *"Consistent with Maine's traditional approach to addressing environmental problems, the goals of this plan are based on a hierarchy designed first to prevent problems, and then, if any should occur, to limit their extent and reduce their effects. Prevention carries a price tag, but it is the only possible way to avoid incurring much higher costs associated with the environmental, economic, and social disruptions that follow infestations of aquatic invasive organisms."*

The first goal of this plan is to prevent the new introductions wherever possible.

In January 2005, MDIFW confirmed the presence of northern pike, a designated invasive species, in Pushaw Lake. A lake management plan was developed with the main goal of preventing further spread of this invasive species as well as controlling the population in Pushaw Lake. The outlet of Pushaw Lake flows into the Penobscot River in Old Town, above the Milford-Old Town Dam. The plan states that *"Limiting northern pike passage through fishways at a number of dams on the Penobscot, Piscataquis and Passadumkeag Rivers is essential in limiting their movement through the drainage, and may be our last defense in excluding pike in the Upper Penobscot Watershed."*

Presidential Executive Order 13112, signed in February 1999, was created to control and minimize the impacts of invasive species by establishing an Invasive Species Council, and by establishing duties of Federal agencies whose actions affect the status of invasive species. Specifically, Section 2, Paragraph 3 states that Federal agencies shall not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the U.S. or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by the invasive species; and that all feasible and prudent measures to minimize the risk of harm will be taken in conjunction with the actions. Note that the actions to be taken by Federal agencies must occur before authorizing, funding, and action.

The ecosystem in the Penobscot River drainage has seen significant changes since the last relicensing. Invasive species, including northern pike, black crappie, largemouth bass, and white catfish have been documented in the lower Penobscot drainage. Northern pike and largemouth bass are now well-established in Pushaw Lake, which drains into the Stillwater River. As a result, these two species have access to the mainstem of the Penobscot River above the dams in Milford and Orono. At some time in the future, they will likely move upstream as far as the East Millinocket Dam, which is the lowest dam of the Penobscot Mills project. MDIFW is concerned that allowing these species to gain upstream access will directly impact wild and native fisheries. We are also concerned that allowing these species to have access to the impoundments in the Project areas will create additional sources for anglers to relocate these invasive fish to waters outside of that which they could travel on their own. This activity has been well-documented in Maine in the Belgrade Lakes region where northern pike were illegally introduced in the 1970's. They have since spread throughout the lower Kennebec and Androscoggin drainages, as well as other drainages as a result of natural migration, dam removal, and unauthorized introductions.

Baxter State Park is a short distance from the Project area and is renowned for its wild and native brook trout waters. There are also many designated State Heritage Fish Waters that drain

directly into the West Branch drainage above the North Twin impoundment. State Heritage Fish Waters are native and wild brook trout lakes and ponds which represent unique, valuable, and irreplaceable ecological and angling resources. MDIFW recognizes the unrivaled historic and economic importance of Maine's wild and native brook trout resource and focuses on the conservation and protection of this uniquely valuable resource. MDIFW's primary intent for managing wild brook trout in lakes and ponds is the protection and conservation of these self-sustaining fisheries. Allowing fish passage into the North Twin impoundment would allow invasive fish to have access to other upstream waters including the Nahmakanta and Debsconeag systems, and the West Branch of the Penobscot River itself, which is a destination fishery for wild landlocked salmon and native brook trout.

The absence of fish passage in these project dams on the West Branch of the Penobscot represent the best opportunity to prevent the expansion of invasive fish in Maine and to protect the important wild and native freshwater game species upstream in the drainage.

***Ripogenus Project Operations Recommendations for Fisheries/Angling Enhancement***

1. To better understand lake level fluctuations at the Ripogenus impoundment, MDIFW requests that the Licensee provide daily lake elevations and daily minimum, mean, and maximum flows from Ripogenus Dam since the current license was issued.
2. MDIFW has concerns that even during low water years, the Licensee ran flows in excess of the required minimum flows. MDIFW observed on several occasions in the winter and summer of 2021 that the Licensee was indeed running in excess of 3,000 cfs when lower flows were required by the license; however, we do not know the frequency of these occurrences and whether they were necessary for downstream needs, and/or whether they significantly impacted lake elevations in the Ripogenus impoundment. We have received anecdotal reports from anglers on the West Branch that insect hatches are less frequent and less intense than in the past. As the literature is replete with examples of the detrimental impacts on the riverine fisheries and aquatic communities from rapid changes in flow, and that the literature indicates that flow changes of less than 25% per hour (ramping rate) can mitigate impacts from peaking power, we request flow records to evaluate the frequency of flow changes that exceed 25%.
3. Six angler sites were identified at McKay Station during the previous relicensing studies. When Brookfield purchased the Project, large areas around the power station were fenced off, eliminating most of the fishing sites. MDIFW believes there is now only one site available on the south side of the river (just upstream of the power station). We request Brookfield move this fencing to restore the historic angling sites at this location.
4. There were two fisheries enhancements projects completed under the current license: 1) the construction of the Holbrook Bypass channel, and 2) the release of 100 cfs into the Upper Gorge from July 1 – September 30. The Licensee has completed the required evaluation for the Holbrook Bypass and MDIFW concurs that this project has been successful. The Licensee and MDIFW have verified the presence of young wild salmon and brook trout in the channel. We simply request that the Licensee continue to operate and maintain the Holbrook Side Channel as outlined in the current license, Order approving recommendations of habitat improvement plan under Article 406, Issued February 20, 2003.

The purpose of the supplemental flow in the Upper Gorge was solely to provide fishing opportunities. Multiple sites were identified in previous studies that would provide additional fishing opportunities in the Upper Gorge. It was the intent of MDIFW that the flows in the Upper Gorge would originate from a deep gate and therefore provide a cool water attraction flow as adult salmon reached the upper river in July. However, the water is released from a sluice (surface) gate which is warm water. This water is warmer than the water passing through McKay Station into the river and is therefore ineffective as an attraction flow. We request Brookfield develop a plan to provide a 100 cfs flow from July 1 to September 30 into the Upper Gorge from below 45 feet (summer thermocline location) in the impoundment to fulfill the original intent of this mitigation and provide additional fishing opportunities.

5. MDIFW supports target lake elevations on the Ripogenus Impoundment that allow for angler use and access. We consider this to be a reasonable request and is commonplace on FERC-regulated impoundments throughout Maine, including waters upstream and downstream of the Ripogenus Project. The paper mills are no longer operational in Millinocket and East Millinocket, which should give the Licensee more flexibility to manage water in this integrated system. As we realize this is a complicated issue with competing needs downstream of the Ripogenus Dam, we recommend developing a Stakeholder Group with representation from all the interested parties, including the camp owners on the Ripogenus impoundment who were not involved with the previous relicensing process, to determine appropriate lake elevations during the recreational season and refine downstream flows as necessary. As noted previously in our comments, we view this as an opportunity to refine the current operation and minimize the unintended impacts, especially during drought conditions.

***Penobscot Mills Recommendations for Fisheries/Angling Enhancement***

1. Article 413 of the current license directs the Licensee to perform the May and September trout stocking in Millinocket Stream. Given increased angling pressure in the region, MDIFW recommends that this program continue for the duration of the new license.
2. To enhance public access opportunities, MDIFW requests that the Licensee establish a public launch in the East Millinocket impoundment. It is MDIFW's understanding that the Licensee has retained property easement/development rights along the impoundment shoreline, and now that the mill is no longer operational, we believe it should not be an issue to have private vehicles accessing former mill property. Final details need to be worked out, but MDIFW envisions a launch for small watercraft, similar to the Licensee-established boat launch below the North Twin Dam, along with associated parking for three to four vehicles with trailers and appropriate signage, would be sufficient for angling access between the East Millinocket Dam and the Dolby Dam, an approximately 1.75 mile stretch of the West Branch Penobscot River.

## Wildlife Study Requests

### Study Request 1: Assess the presence of Wood Turtles and Project effects on nesting habitat, nesting success, and overwintering habitat

1. The goal of this study is twofold: first, to confirm the presence of wood turtles (*Glyptemys insculpta*) in the Ripogenus and Penobscot Mills Project areas, and the West Branch of the Penobscot River downstream of the dams, and secondly to determine whether Project operations negatively impact wood turtles and whether operations could be adjusted to benefit both wood turtle nesting and overwintering habitat.

The initial objective is to determine if wood turtles are present within the portion of the West Branch that is influenced by Project operations. Wood turtles are present in the West Branch upstream of the Ripogenus Project area (Northeast carry TWP in West Branch and also Russell Stream), and presence seems likely elsewhere based on desktop analysis of aerial imagery, a recent cursory trip to the Project area by MDIFW staff, available habitat, and additional occurrences of the species, both confirmed and unverified, in the Project vicinity.

If wood turtle presence is confirmed, the study would transition into understanding the effects that Project operations have on both wood turtle nesting and overwintering habitats, and whether operations have affected the quality and availability of these habitats over time. The study would document wood turtle nesting and overwintering habitats within the Project effect areas and measuring what effect water flows and fluctuations have on wood turtle use of these habitats. The final objective is to apply the site-specific understanding of wood turtle habitat use and evaluate potential management actions that would benefit nesting habitat and nesting success, and overwintering habitat in the Ripogenus and Penobscot Mills Project areas and the West Branch downstream of the dams.

2. MDIFW is the natural resource agency responsible for managing wildlife resources along the West Branch of the Penobscot River. Wood turtles are designated as a State Species of Special Concern. A Species of Special Concern is any species of fish or wildlife that does not meet the criteria of an Endangered or Threatened species but is particularly vulnerable, and could easily become, an Endangered, Threatened, or Extirpated species due to restricted distribution, low or declining numbers, specialized habitat needs or limits, or other factors. Hydroelectric dams have been identified as a threat to wood turtles in Maine's 2015 State Wildlife Action Plan.

3. MDIFW is a cabinet-level agency of the State of Maine.

4. Wood turtles are facing range-wide declines and are listed as a Tier 1 Species of Special Concern in Maine. They are also designated as an "at risk species" by the USFWS and are currently under consideration for federal Endangered Species Act listing. Previous research in western Maine along the Dead River below the Flagstaff Project (FERC No. P-2612) by Compton (1999) determined that dams are a major threat to wood turtles because of flooding and degradation of nesting sites. Aerial imagery and a recent site visit indicate that suitable wood

turtle nesting and overwintering habitat likely exists downstream of the Ripogenus Dam and elsewhere.

Given both the potential for wood turtles to occur in the reaches of the West Branch below the dams, and within areas effected by Project operations, and the known effects dams have on wood turtles, a survey for wood turtles is warranted to determine the effects high flow releases have on wood turtles during their nesting season.

5. Intensive study of impacts to wood turtles from the Flagstaff Project determined that 25% of wood turtle nests failed as a result of high flows during nesting season (Compton 1999). If wood turtles are found in the Project areas, including in the West Branch downstream of the dams, Project operations should be assessed to determine the level of impact on wood turtle nesting habitat, nesting success, and overwintering habitat. A better understanding of the relationship between Project operations and turtle habitat availability and successful use of these habitats will help guide discussions to minimize or eliminate Project impacts on wood turtles should they be occurring.

6. Surveys should be conducted to determine wood turtle habitat and presence in early spring, prior to the start of wood turtle nesting. Survey methods outlined in Brown et. al. (2017) is recommended to confirm presence of wood turtles. If presence is confirmed, telemetry tags will be affixed to a sample of turtles, with actual numbers to be determined, that will be monitored for both nesting and overwintering locations. Nests will be monitored following similar methods outlined in Compton (1999). Nesting success relative to Project operations will be monitored to determine nesting success and measure effects from Project operations, including water flows, especially regarding planned and unplanned high flow release events that occur within the wood turtle nesting season.

Once nesting and overwintering habitats are documented, a review of existing habitat conditions should be compared with habitat conditions over time to evaluate potential changes in habitats. Of particular interest is whether flow regimes maintain open gravel bar habitat preferred by nesting wood turtles. MDIFW is willing to collaborate with the Licensee on this study. MDIFW would assist in various phases of the study including study design, scoping, and survey effort.

7. This type of study would require funding for 1-2 seasonal staff and their associated transportation. The project would begin operating after the spring snow melt and run as long as weather conditions allow to better document any overwintering sites. The first phase of the project would entail intensive turtle surveys, and if located and tagged, the project would shift to monitoring of tagged turtles and locating nesting and overwintering locations. Once all nests had been located, the final phase of fieldwork would involve monitoring of nesting success relative to water flow regimes.

Once nesting habitat is identified, a desktop analysis of habitat changes over time would be assessed through review of satellite imagery and would likely require several days of review and reporting to summarize findings.

A final report would summarize findings and review effects flow regimes have on nesting success and nesting habitat. The reporting phase would require two weeks of work for one

person. Researchers should also prepare and present a summary of the findings to Project stakeholders.

**Study Request 2: Exposed Aquatic Habitat Assessment**

1. The goal of this study is to quantify the total area of exposed aquatic substrate of all waterbodies comprising both the Ripogenus Project and Penobscot Mills Project. The assessment should consider exposed substrate, relative to the full pond elevation of each waterbody, during three scenarios:

- 10-year average annual drawdown for each waterbody
- low-water years for each waterbody, using 2021 water levels
- under maximum allowable drawdown for each waterbody

Additionally, we are requesting a quantitative assessment of exposed aquatic substrates in the downstream riverine ecosystems for each project. Analyses of downstream riverine ecosystems should also include both the "Back Channel" (mainstem West Branch downstream of Quakish Lake) and Millinocket Stream.

2. MDIFW is the natural resource agency responsible for managing fish and wildlife resources along the West Branch of the Penobscot River, with "wildlife" defined as all animals including insects and macroinvertebrates. As the life history of inland fish and many aquatic wildlife are closely tied to the stability and area of the near-shore littoral zone, MDIFW is concerned that some of these resources are negatively impacted by the frequency and extent of aquatic drawdown events on the West Branch of the Penobscot River. The macroinvertebrate community plays an important role in the composition of an aquatic ecosystem. Macroinvertebrates are a food source for the fishery and other aquatic resources that may be present.

3. MDIFW is a cabinet-level agency of the State of Maine.

4. Maine's 2015-2025 Wildlife Action Plan identifies 378 Species of Greatest Conservation Need (SGCN) within six major taxa groups, many of which are located or predicted to be in the Project area. The Plan also identifies the habitats in Maine needed by each SGCN, the greatest stressors affecting SGCN and their habitats, and some of the conservation actions that can be taken to reduce these stressors. Among state-listed species, MDIFW has confirmed the presence of: a) two State Threatened freshwater mussel species (and the potential for a third); b) State Special Concern pygmy snaketail dragonflies in the West Branch downstream of Ripogenus Dam; and c) State Special Concern bigmouth pondsnails in Millinocket Lake. A list of documented, modeled, and predicted SGCN aquatic or aquatic-associated invertebrate species in the Project areas includes:

| | | |
|---|---|---|
| 1 | *Aeshna juncea* | Sedge Darner |
| 2 | *Alasmidonta undulata* | Triangle Floater |
| 3 | *Alasmidonta varicosa* | Brook Floater |
| 5 | *Ameletus browni* | A Mayfly |
| 6 | *Anodonta implicata* | Alewife Floater |
| 7 | *Baetisca berneri* | A Mayfly |
| 8 | *Baetisca lacustris* | A Mayfly |
| 9 | *Baetisca rubescens* | A Mayfly |
| 10 | *Boloria frigga saga* | Frigga Fritillary |
| 11 | *Cicindela ancocisconensis* | White Mountain Tiger Beetle |
| 12 | *Cicindela marginipennis* | Cobblestone Tiger Beetle |
| 13 | *Enallagma carunculatum* | Tule Bluet |
| 14 | *Enallagma laterale* | New England Bluet |
| 15 | *Enallagma pictum* | Scarlet Bluet |
| 16 | *Epeorus frisoni* | Roaring Brook Mayfly |
| 17 | *Lampsilis cariosa* | Yellow Lampmussel |
| 18 | *Lanthus vernalis* | Southern Pygmy Clubtail |
| 19 | *Leptodea ochracea* | Tidewater Mucket |
| 20 | *Leucorrhinia patricia* | Canada Whiteface |
| 21 | *Lycaena dorcas claytoni* | Clayton's Copper |
| 22 | *Margaritifera margaritifera* | Eastern Pearlshell |
| 23 | *Metretopus borealis* | A Mayfly |
| 24 | *Ophiogomphus colubrinus* | Boreal Snaketail |
| 25 | *Ophiogomphus howei* | Pygmy Snaketail |
| 26 | *Papilio brevicauda gaspeensis* | Short-tailed Swallowtail |
| 27 | *Parameletus midas* | A Mayfly |
| 28 | *Procloeon ozburni* | A Mayfly |
| 29 | *Rhithrogena undulata* | A Mayfly |
| 30 | *Siphlonisca aerodromia* | Tomah Mayfly |
| 31 | *Siphlonurus barbaroides* | A Mayfly |
| 32 | *Siphlonurus barbarus* | A Mayfly |
| 33 | *Siphlonurus demaryi* | A Mayfly |
| 34 | *Siphlonurus securifer* | A Mayfly |
| 35 | *Somatochlora brevicincta* | Quebec Emerald |
| 36 | *Stagnicola mighelsi* | Bigmouth Pondsnail |
| 37 | *Vertigo paradoxa* | Mystery Vertigo |

Species listed under Maine's Endangered Species Act (MESA, 12 M.R.S §12801 et. seq.) are afforded special protection against activities that may cause "take" (kill or cause death), "harassment" (create injury or significantly disrupt normal behavior patterns), and other adverse actions. These prohibitions encompass both negligent and intentional acts. A Species of Special Concern is any species of fish or wildlife that does not meet the criteria of an Endangered or Threatened species but is particularly vulnerable, and could easily become, an endangered, threatened, or extirpated species due to restricted distribution, low or declining numbers, specialized habitat needs or limits, or other factors.

Given both the known and predicted occurrences of these numerous at-risk aquatic or aquatic-associated invertebrate species, MDIFW wants to better understand the amount of aquatic habitat that will be potentially impacted, both from actual average annual and maximum drawdowns and riverine water level fluctuations, as well as what is allowed and proposed for the new license.

5. As each of the Threatened, Special Concern, and SGCN species is completely dependent upon suitable aquatic habitat for their life history requirements, water level fluctuations in both lacustrine and riverine environments have the potential to adversely impact these species.

6. Evaluations of drawdown zones and assessments of riverine areas subjected to flow variations are commonly requested for hydropower project relicensing. This study recommendation may parallel other agency study requests.

7. MDIFW asserts that the level of cost and effort is commensurate given the historical, current, and proposed operations for each Project. While near accuracy is of the utmost importance, MDIFW mostly envisions that a desktop, GIS-based exercise will be sufficient for completing the study. Once elevations for the 10-year average, low-water year (using the lowest 2021 elevation), and maximum allowable drawdown elevation under the current and proposed license are identified, a desktop analysis which results in quantitative amounts of substrate exposed for each waterbody, including a combined cumulative total, under each scenario should be reasonably attainable. As part of this assessment, inclusion of any aerial imagery existing photographs might prove instructive. The results should also document the frequency, length, and timing of drawdowns and downstream flow fluctuations, as these can exacerbate or amplify impacts of area exposed. We estimate that this effort would likely require several days of review and reporting to summarize findings.

**Study Request 3: Common Loon Management Plan Assessment—Ripogenus Project**

1. The goal of this study is to evaluate the Licensee's Common Loon Management Plan (Plan) at the Ripogenus Project. Specific objectives of this request are to:

- Assess use of rafts by loons at the Ripogenus impoundment
- Evaluate loon productivity under the Plan
- Determine if Project operations, particularly during low water years, are impacting loon productivity and if new strategies need to be incorporated into the Plan

2. Maine is home to 75% of the territorial pairs of loons in New England and New York, making it the stronghold for the northeast breeding population. Thus, despite the common loon's relatively stable and secure population within the state, Maine holds a high responsibility in the northeastern United States for the species' continued conservation.

MDIFW is interested in better understanding the effectiveness of the Plan, and whether loon productivity is being impacted, particularly during lower water years. This study request is consistent with MDIFW's goal of ensuring that wildlife and aquatic resources in the State of Maine are maintained and perpetuated for their intrinsic and ecological values, for their economic contribution, and for their recreational, scientific and educational use by the people of

the State. Furthermore, the common loon is identified as a Priority 2 Species of Greatest Conservation Need by MDIFW's Comprehensive Wildlife Conservation Strategy, also known as Maine's State Wildlife Action Plan (MDIFW 2015).

This study is consistent with USFWS' re-licensing goals to evaluate the need for protection, mitigation and enhancement measures necessary to meet state and federal fish and wildlife objectives; to conserve, protect and enhance the habitats for fish, wildlife and plants that continue to be affected by the Project; and to ensure that the public is afforded the opportunity for recreation on Project lands, which include but are not limited to fishing, hunting, bird watching, and other forms of outdoor recreation.

3. MDIFW is a cabinet level agency of the State of Maine.

4. According to Table 4.6-1 of the PAD, the Licensee began deploying artificial nesting platforms for loons and "other aquatic birds" in the Ripogenus impoundment in 2000. The Licensee monitored the loon nesting habitat and success from 1998 through 2010, and although monitoring was discontinued in 2010, the Licensee continues to deploy the platforms on Ripogenus impoundment and increased the number of platforms beginning in 2011.

However, limited details are provided in the PAD, and it is unclear to MDIFW how successful the loon management program is at the Ripogenus impoundment. Details on productivity of common loons there are unknown. This is especially critical given that recent low water years have likely left some rafts stranded, making them unusable to resident nesting loons. Also unknown is whether rafts are actively maintained on an annual basis, and whether rafts are being stranded and abandoned under low water conditions, thereby rendering the existing placement of rafts ineffective.

5. The effects of dam operations on loon population are well known, as evidenced by the Licensee's Management Plan. The results of this study request will help determine if additional mitigation measures are necessary, and what specific measures may be needed, in order to prevent negative impacts to loon productivity within the Project area.

6. Standard survey methods developed by the Loon Preservation Committee in New Hampshire and the BioDiversity Research Institute, were adopted by the Northeast Loon Study Working Group that includes weekly surveys by boat from mid-May until the end of July (Taylor and Evers 2009). Bi-weekly surveys are often needed to monitor chick survival. Nest searching may require walking portions of shoreline to determine if natural nesting is being attempted. Data collected during surveys, depending on the timing within the loon nesting cycle, should include: number of territorial pairs, delineation of territory boundaries defended by those pairs, number and location of nesting attempts differentiated between natural sites and artificial sites; determining causes of nest failure and/or raft abandonment, observations of clutch size and number of chicks hatched, and documenting chick survival.

7. Field work will be required to collect data on presence/absence of territorial loon pairs, nesting attempts, and to determine causes of nest failures, particularly at artificial sites. MDIFW envisions at least three years of field work by qualified loon biologists to determine the

effectiveness of the Plan, and whether modifications of the Plan need to occur to benefit this SGCN species for the duration of the new license.

## Literature Cited

Maine Department of Inland Fisheries and Wildlife. 2015. Maine's wildlife action plan. Maine Dept. of Inland Fisheries and Wildlife, Augusta, ME.

Taylor, K.M. and D.C. Evers. 2009. BioDiversity Research Institute: Protocol for surveying and managing common loon populations. Report BRI 2009-16, BioDiversity Research Institute, Gorham, ME.

## Study Request 4: Common Loon Productivity Assessment—Penobscot Mills Project

1. The goals of this study are to evaluate the common loon nesting success within the Penobscot Mills Project area, determine if operations of the Project are affecting loon productivity within the study area, and assess causes of nest failure to determine if these failures are influenced by Project operations.

2. Maine is home to 75% of the territorial pairs of loons in New England and New York, making it the stronghold for the northeast breeding population. Thus, despite the common loon's relatively stable and secure population within the state, Maine holds a high responsibility in the Northeastern United States for the species' continued conservation.

MDIFW is interested in better understanding what effects, if any, the current Penobscot Mills Project operations have on common loon productivity. Specifically:

- Millinocket Lake: current and proposed Project operations maintain the Millinocket Lake reservoir level between elevations 470 and 480 feet at the Millinocket Lake Storage Development while providing water to maintain North Twin impoundment levels.
- North Twin: the Licensee maintains the North Twin impoundment at a relatively stable level from May 1 - August 22 annually ("relatively stable level" is not defined).

3. MDIFW is a cabinet level agency of the State of Maine.

4. As a condition of the existing license, in 2000 the Licensee deployed artificial nesting platforms for loons in Millinocket Lake. The Licensee monitored the loon nesting habitat and success from 1998 through 2010, and the monitoring indicated that loons successfully nested naturally on Millinocket Lake without artificial nest platforms. Subsequently, the Licensee discontinued deployment of nesting platforms and the associated monitoring and report in 2011.

It has been well documented that water level changes as little as 0.5 vertical feet up or 1 vertical foot down occurring within a 28-day period can significantly impact the success of non-floating loon nests (Fair et al. 1999). Due to their physical inability to walk about on land, common loons build their nests directly adjacent to the water's edge; however, the placement of nests

immediate to the shore makes them extremely susceptible to fluctuations in water level. Nests may be inundated by increasing water levels or stranded by decreasing water levels; both situations enhance predation and affect hatching rates (Fair 1979). Water level management was shown to cause 60-70% of nest failure for loons on three lakes in Voyageur's National Park in Minnesota (Reiser 1988). Loons whose territories are characterized by fluctuating water levels may not hatch a sufficient number of young to sustain populations, resulting in an ecological trap (DeSorbo et al. 2007).

It has been 10 years since common loon productivity has been assessed at the Penobscot Mills Project, and since that time there have been at least three low water years (2016, 2020, 2021). Given the growing realization of changing weather patterns associated with climate change, and given the proposed allowable magnitude of lake level fluctuations requested for the new License, MDIFW believes that a re-assessment of common loon productivity is warranted.

5. The potential effects of dam operations on the local loon population are outlined above. The study results will help determine if additional mitigation measures are necessary, and what specific measures may be needed, in order to prevent negative impacts to loon productivity within the Project area.

6. Standard survey methods developed by the Loon Preservation Committee in New Hampshire, the BioDiversity Research Institute, and adopted by the Northeast Loon Study Working Group include weekly surveys by boat beginning in mid- to late- May and continuing through July (Taylor and Evers 2009). Bi-weekly surveys are often needed to monitor chick survival. Nest searching may require walking portions of shoreline. Data collected during surveys, depending on the timing within the loon nesting cycle, should include: number of territorial pairs, delineation of territory boundaries defended by those pairs, number and location of nesting attempts, determining causes of nest failure, observations of clutch size and number of chicks hatched, and documenting chick survival.

7. Field work will be required to collect data on presence/absence of territorial loon pairs. If territorial pairs exist, then at least two additional years of field work will be needed to determine fledging rates and causes of nest failure. If fledging rates are lower than 0.48 chicks per territorial pair, which is needed to support a stable and sustaining population, then annual monitoring and possibly a raft management plan or more stable water levels may be necessary.

## Literature Cited

DeSorbo, C.R., K.M. Taylor, D.E. Kramar, J. Fair, J.H. Cooley, Jr., D.C. Evers, W. Hanson, H.S. Vogel, and, J.L. Atwood. 2007. Reproductive advantages for Common Loons using rafts. Journal of Wildlife Management 71(4):1206–1213.

Fair, J. 1979. Water level fluctuations and Common Loon nest failure. Pp. 57-62 in S. A. Sutcliffe (ed.). Proc. N. Am. Conf. on Common Loon research and management. Natl. Audubon Soc., Washington, DC.

Fair, Jeff, Kyle J. Murphy, and William Hanson. 1999. 1999 Indian Pond Common Loon Population and Productivity Surveys and Management Efforts. Unpubl. Rep. to Florida Power and Light Energy, Portland, ME. 25 pp.

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Reiser, M. H. 1988. Effects of regulated lake levels on the reproductive success, distribution and abundance of the aquatic bird community in Voyageurs National Park, Minnesota. Natl. Park Serv. Res. Reourc. Manage. Rept. MWR-13. Omaha, Nebraska. 67pp.

Taylor, K.M. and D.C. Evers. 2009. BioDiversity Research Institute: Protocol for surveying and managing common loon populations. Report BRI 2009-16, BioDiversity Research Institute, Gorham, ME.

**Study Request 5: Marsh Bird Surveys—Ripogenus Project**

1. The goal of this study is to determine if any rare marsh-nesting birds (least bittern (*Ixobrychus exilis*), sedge wren (*Cistothorus platensis*), black tern (*Chlidonias niger*), common gallinule (*Gallinula galeata*), and American coot (*Fulica americana*)) occur in the study area, and if operation of the Ripogenus Project is potentially affecting their productivity. This study will consist of two phases:

   a. A desktop study of emergent marsh wetlands associated with the Ripogenus Project will be conducted based on review of aerial photographs and mapped inland waterfowl and wading bird habitats. The desktop study will help determine wetlands where marsh bird surveys should be conducted.

   b. Once suitable habitat has been identified, the Standardized North American Marsh Bird Monitoring Protocol (Conway 2009) will be used to survey for rare marsh birds. Based on the large size of the Project, locations and suitability of potential habitat for these targeted marsh-nesting bird species must be assessed with a field visit prior to establishment of survey locations to maximize the efficiency and scientific validity of the surveys.

2. MDIFW is responsible for protecting wildlife resources and is interested in better understanding the presence and distribution of rare marsh birds in the wetlands at the Ripogenus impoundment. The least bittern, sedge wren, and black tern are listed as Endangered Species in Maine, the common gallinule is listed as a State Threatened Species, and the American coot is listed as a Species of Special Concern in Maine. Species listed under Maine's Endangered Species Act (MESA, 12 M.R.S §12801 et. seq.) are afforded special protection against activities that may cause "take" (kill or cause death), "harassment" (create injury or significantly disrupt normal behavior patterns), and other adverse actions. These prohibitions encompass both negligent and intentional acts. A Species of Special Concern is any species of fish or wildlife that does not meet the criteria of an Endangered or Threatened species but is particularly vulnerable, and could easily become, an endangered, threatened, or extirpated species due to

restricted distribution, low or declining numbers, specialized habitat needs or limits, or other factors.

3. MDIFW is a cabinet level agency of the State of Maine.

4. There is limited knowledge regarding the status and trends of several species of marsh birds in Maine, and throughout much of North America. Many marsh bird populations in North America appear to be declining (Tate 1986, Eddleman et al. 1988, Conway 2009), and there is anecdotal evidence of declines for some species in Maine. Many historic breeding sites are no longer occupied, thus survey of potential new sites is extremely important for understanding each species' status within the state.

Based on field surveys conducted for the previous relicensing in the late 1980s and early 1990s, several categories of wetlands were identified at the Ripogenus Project, including: 1) alder thickets; 2) conifer swamp/wet forest; 3) wet meadow/emergent marsh and wet meadow/open water; and 4) open bog/wet meadow. According to the PAD, there are 358.8 acres of palustrine emergent wetland and 790.1 acres of palustrine scrub-shrub wetland at the Ripogenus Project; these habitats should be the focus for marsh bird surveys.

Least bitterns breed in freshwater marshes and usually nest in dense stands of cattails, bulrushes or similar growth about a foot above the water and near open water. Occasionally they nest in a low bush or tree or on the old nest of another bird. Least bitterns generally nest singly but several adjacent pairs may occur in suitable areas (Baicich and Harrison 2005).

Sedge wrens breed in wet meadows or drier areas of marshes and bogs dominated by grasses and sedges. The birds nest low in grasses, sedges, or similar herbaceous species, very near the ground or over shallow water. Nests are well hidden in the bases or growing vegetation but rarely can be 1-2 feet up in the vegetation (Baicich and Harrison 2005).

Black terns breed on shallow, still water, in freshwater or brackish areas, that are often characterized by reedy vegetation and swampy marshes. The birds can create a variety of nests including: as a heap of floating vegetation in the water, anchored by growing plants, or on mats of floating aquatic vegetation or heaps of fallen herbaceous vegetation; on old muskrat houses, old grebe or coot nests, or floating driftwood; or on firm ground among marshy herbaceous vegetation. Black terns generally nest in small colonies (Baicich and Harrison 2005).

Common gallinules breed at the edge of fresh water including lakes, rivers, small marshes, and ditches. The birds generally nest on the ground by water, or among plants in water, but sometimes they nest above ground in thick shrubs or in large old nests of other birds in trees. The birds may build additional nests (brood platforms) in territory, especially in marshy sites and use the platforms for brooding young (Baicich and Harrison 2005).

American coots breed in freshwater wetlands containing: 1) heavy stands of emergent aquatic vegetation along at least some portion of the shoreline, and 2) some standing water within the vegetation (interspersion). Nests are typically built over water on floating platforms and associated with dense stands of living or dead vegetation such as reeds, cattails, bulrushes,

sedges, and grasses. Occasionally, the nest may be built on the edge of a stand of vegetation, where it is clearly visible (Brisbin et al. 2002).

5. The five species of marsh-nesting birds identified could potentially be positively or negatively affected by water levels, water quality, invasive aquatic plants, and the wake from recreational watercraft. Least bitterns, black terns, common gallinules, and American coots all prefer hemi-marsh conditions, which is a 50:50 ratio of open water to emergent marsh habitat. They nest very close to the water's surface, thus water level fluctuations up or down can flood nests or make them more vulnerable to predation. They rely primarily on aquatic invertebrates for food, which are directly influenced by water quality.

The extent and locations of emergent marsh habitat in the Ripogenus Project will first be assessed to determine sites for marsh bird surveys. If rare marsh birds are detected within the Project, additional studies or mitigation measures may be warranted to protect and conserve the species and occupied habitats.

6. The desktop study of emergent marsh wetlands associated with the Ripogenus Project will identify emergent, scrub-shrub, and wet meadow habitat through photo interpretation of aerial photographs and review of mapped inland waterfowl and wading bird habitats, and identify potentially suitable nesting habitat associated with the Ripogenus Project for these five marsh-nesting bird species.

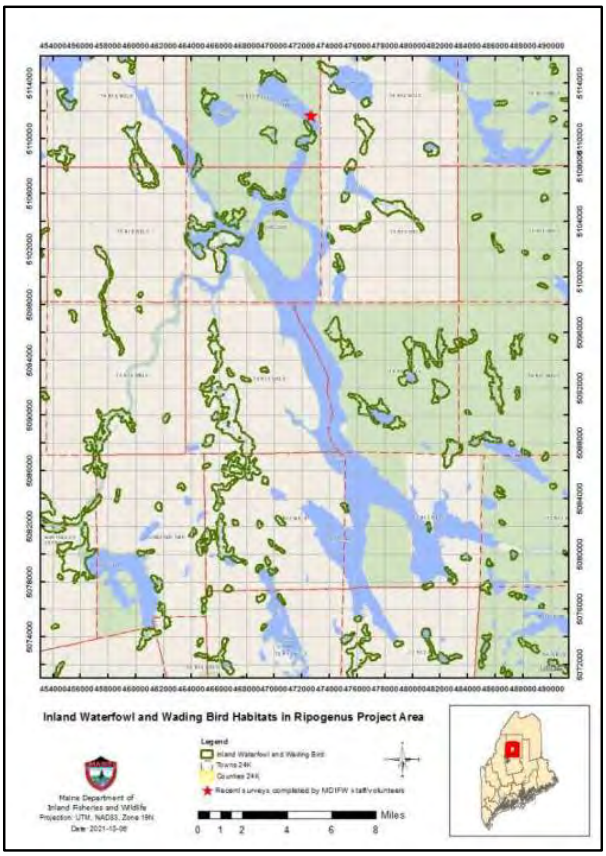
As requested by MDIFW, and consistent with generally accepted scientific practices, the Standardized North American Marsh Bird Monitoring Protocol (Conway 2009) will be used if suitable habitat is identified and marsh-nesting bird surveys are deemed necessary in the Ripogenus Project. The protocol includes in its methods, field broadcast survey at fixed points approximately 400 meters apart within marsh habitat. Based on the large size of the Ripogenus Project, locations and suitability of potential habitat for these targeted marsh-nesting bird species must be assessed prior to establishment of survey locations to maximize the efficiency and scientific validity of the surveys.

The survey will be conducted by playing call-back audio clips in habitat for least bittern, common gallinule, American coot, and sedge wren. Call playback is not used for black terns, but their presence and behaviors should be noted. Survey points will be spaced at least 400 m apart, or approximately one point per 12 ha at a minimum and located along the perimeter of marsh areas that are practical to access via boat so that site disturbance is minimized. Final survey locations will be determined based on field conditions and extent of suitable habitat. The surveys will begin as soon after sunrise as is safely practicable and continue up to 4 hours after sunrise. One survey will be conducted per each 15-day survey period. Survey periods are May 15 - May 31, June 1 – June 14, June 15 – June 30.

7. The level of effort and cost is commensurate with a Project the size of the Ripogenus Project and the likely license term. Given the size of the impoundment and its associated IWWHs, as well as the remote location, the field data collection component of this study will require substantial time and effort. However, the duration of the breeding season is relatively short. Data analysis should be straightforward and require low to moderate effort. MDIFW envisions two qualified biologists with experience conducting marsh bird surveys in Maine to accomplish

this study. The first task will be to identify locations of suitable survey locations. Three surveys at each site will be conducted between May 15 and June 30 (see survey windows above), followed by an estimated two days of report preparation.

MDIFW staff and volunteers have recently conducted marsh bird surveys at select wetlands as part of the Maine Bird Atlas inventory efforts (see Figure below). These sites will not need to be included in this study and MDIFW is willing to share results if Licensee is interested in those data.




## Literature Cited

Baicich, P.J. and Harrison, C.J.O. 2005. Nests, Eggs, and Nestlings of North American Birds. Princeton University Press.

Brisbin Jr., I. Lehr and Thomas B. Mowbray. (2002). American Coot (*Fulica americana*), version 2.0. In The Birds of North America (P. G. Rodewald, editor). Cornell Lab of Ornithology, Ithaca, New York, USA.

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Eddleman, W. R., F. L. Knopf, B. Meanley, F.A. Reid, and R. Zembal. 1988. Conservation of North American rallids. Wilson Bull. 100:458-475.

Federal Energy Regulatory Commission (FERC). 2021. Pre-Application Document, Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2485). Issued November June 11, 2021.

Tate, J. 1986. The blue-list for 1986. Am. Birds 40:227-236.

**Study Request 6: Marsh Bird Surveys—Penobscot Mills Project**

1. The goal of this study is to determine if any rare marsh-nesting birds (least bittern (*Ixobrychus exilis*), sedge wren (*Cistothorus platensis*), black tern (*Chlidonias niger*), common gallinule (*Gallinula galeata*), and American coot (*Fulica americana*)) occur in the study area, and if operation of the Penobscot Mills Project is potentially affecting their productivity. This study will consist of two phases:

a. A desktop study of emergent marsh wetlands associated with the Penobscot Mills Project will be conducted based on review of aerial photographs and mapped inland waterfowl and wading bird habitats. The desktop study will help determine wetlands where marsh bird surveys should be conducted.

b. Once suitable habitat has been identified, the Standardized North American Marsh Bird Monitoring Protocol (Conway 2009) will be used to survey for rare marsh birds. Based on the large size of the Project, locations and suitability of potential habitat for these targeted marsh-nesting bird species must be assessed with a field visit prior to establishment of survey locations to maximize the efficiency and scientific validity of the surveys.

2. MDIFW is responsible for protecting wildlife resources and is interested in better understanding the presence and distribution of rare marsh birds in the wetlands at the Penobscot Mills Project. The least bittern, sedge wren, and black tern are listed as Endangered Species in Maine, the common gallinule is listed as a State Threatened Species, and the American coot is listed as a Species of Special Concern in Maine. Species listed under Maine's Endangered Species Act (MESA, 12 M.R.S §12801 et. seq.) are afforded special protection against activities that may cause "take" (kill or cause death), "harassment" (create injury or significantly disrupt normal behavior patterns), and other adverse actions. These prohibitions encompass both negligent and intentional acts. A Species of Special Concern is any species of fish or wildlife that does not meet the criteria of an Endangered or Threatened species but is particularly vulnerable, and could easily become, an endangered, threatened, or extirpated species due to restricted distribution, low or declining numbers, specialized habitat needs or limits, or other factors.

3. MDIFW is a cabinet level agency of the State of Maine.

4. There is limited knowledge regarding the status and trends of several species of marsh birds in Maine, and throughout much of North America. Many marsh bird populations in North America appear to be declining (Tate 1986, Eddleman et al. 1988, Conway 2009), and there is anecdotal evidence of declines for some species in Maine. Many historic breeding sites are no longer occupied, thus survey of potential new sites is extremely important for understanding each species' status within the state.

Based on field surveys conducted for the previous relicensing in the late 1980s and early 1990s, several categories of wetlands were identified at the Penobscot Mills Project, including: 1) alder thickets; 2) conifer swamp/wet forest; 3) wet meadow/emergent marsh and wet meadow/open water; 4) open bog/wet meadow; and 5) deep marsh/aquatic bed. According to the Pre-Application Document, there are 306.2 acres of palustrine emergent wetland and 379.9 acres of palustrine scrub-shrub wetland at the Penobscot Mills Project; these habitats should be the focus for marsh bird surveys.

Least bitterns breed in freshwater marshes and usually nest in dense stands of cattails, bulrushes or similar growth about a foot above the water and near open water. Occasionally they nest in a low bush or tree or on the old nest of another bird. Least bitterns generally nest singly but several adjacent pairs may occur in suitable areas (Baicich and Harrison 2005).

Sedge wrens breed in wet meadows or drier areas of marshes and bogs dominated by grasses and sedges. The birds nest low in grasses, sedges, or similar herbaceous species, very near the ground or over shallow water. Nests are well hidden in the bases or growing vegetation but rarely can be 1-2 feet up in the vegetation (Baicich and Harrison 2005).

Black terns breed on shallow, still water, in freshwater or brackish areas, that are often characterized by reedy vegetation and swampy marshes. The birds can create a variety of nests including: as a heap of floating vegetation in the water, anchored by growing plants, or on mats of floating aquatic vegetation or heaps of fallen herbaceous vegetation; on old muskrat houses, old grebe or coot nests, or floating driftwood; or on firm ground among marshy herbaceous vegetation. Black terns generally nest in small colonies (Baicich and Harrison 2005).

Common gallinules breed at the edge of fresh water including lakes, rivers, small marshes, and ditches. The birds generally nest on the ground by water, or among plants in water, but sometimes they nest above ground in thick shrubs or in large old nests of other birds in trees. The birds may build additional nests (brood platforms) in territory, especially in marshy sites and use the platforms for brooding young (Baicich and Harrison 2005).

American coots breed in freshwater wetlands containing: 1) heavy stands of emergent aquatic vegetation along at least some portion of the shoreline, and 2) some standing water within the vegetation (interspersion). Nests are typically built over water on floating platforms and associated with dense stands of living or dead vegetation such as reeds, cattails, bulrushes, sedges, and grasses. Occasionally, the nest may be built on the edge of a stand of vegetation, where it is clearly visible (Brisbin et al. 2002).

5. The five species of marsh-nesting birds identified could potentially be positively or negatively affected by water levels, water quality, invasive aquatic plants, and the wake from recreational

watercraft. Least bitterns, black terns, common gallinules, and American coots all prefer hemi-marsh conditions, which is a 50:50 ratio of open water to emergent marsh habitat. They nest very close to the water's surface, thus water level fluctuations up or down can flood nests or make them more vulnerable to predation. They rely primarily on aquatic invertebrates for food, which are directly influenced by water quality.

The extent and locations of emergent marsh habitat in the Penobscot Mills Project will first be assessed to determine sites for marsh bird surveys. If rare marsh birds are detected within the Project, additional studies or mitigation measures may be warranted to protect and conserve the species and occupied habitats.

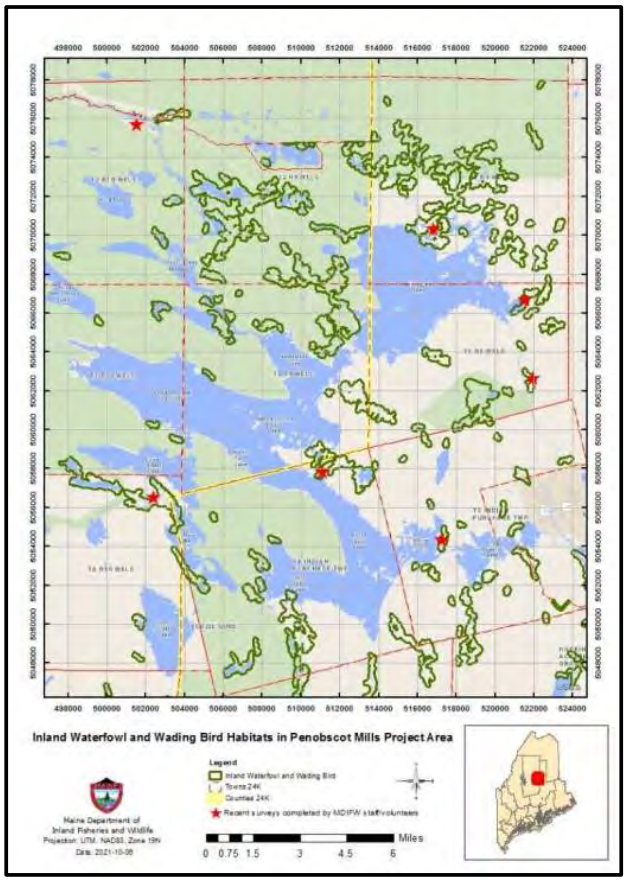
6. The desktop study of emergent marsh wetlands associated with the Penobscot Mills Project will identify emergent, scrub-shrub, and wet meadow habitat through photo interpretation of aerial photographs and review of mapped inland waterfowl and wading bird habitats, and identify potentially suitable nesting habitat associated with the Penobscot Mills Project for these five marsh-nesting bird species.

As requested by MDIFW, and consistent with generally accepted scientific practices, the Standardized North American Marsh Bird Monitoring Protocol (Conway 2009) will be used if suitable habitat is identified and marsh-nesting bird surveys are deemed necessary in the Penobscot Mills Project. The protocol includes in its methods, field broadcast survey at fixed points approximately 400 meters apart within marsh habitat. Based on the large size of the Penobscot Mills Project, locations and suitability of potential habitat for these targeted marsh-nesting bird species must be assessed prior to establishment of survey locations to maximize the efficiency and scientific validity of the surveys.

The survey will be conducted by playing call-back audio clips in habitat for least bittern, common gallinule, American coot, and sedge wren. Call playback is not used for black terns, but their presence and behaviors should be noted. Survey points will be spaced at least 400 m apart, or approximately one point per 12 ha at a minimum and located along the perimeter of marsh areas that are practical to access via boat so that site disturbance is minimized. Final survey locations will be determined based on field conditions and extent of suitable habitat. The surveys will begin as soon after sunrise as is safely practicable and continue up to 4 hours after sunrise. One survey will be conducted per each 15-day survey period. Survey periods are May 15 - May 31, June 1 – June 14, June 15 – June 30.

7. The level of effort and cost is commensurate with a Project the size of the Penobscot Mills Project and the likely license term. Given the size of the impoundment and its associated IWWHs, as well as the remote location, the field data collection component of this study will require substantial time and effort. However, the duration of the breeding season is relatively short. Data analysis should be straightforward and require low to moderate effort. MDIFW envisions two qualified biologists with experience conducting marsh bird surveys in Maine to accomplish this study. The first task will be to identify locations of suitable survey locations. Three surveys at each site will be conducted between May 15 and June 30 (see survey windows above), followed by an estimated two days of report preparation.

MDIFW staff and volunteers have recently conducted marsh bird surveys at select wetlands as part of the Maine Bird Atlas inventory efforts (see Figure below). These sites will not need to be included in this study and MDIFW is willing to share results if Licensee is interested in those data.




## Literature Cited

Baicich, P.J. and Harrison, C.J.O. 2005. Nests, Eggs, and Nestlings of North American Birds. Princeton University Press.

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Tate, J. 1986. The blue-list for 1986. Am. Birds 40:227-236.

**Study Request 7: Furbearer Survey—Ripogenus Project**

1. The goals of this study are as follows:

- Assess the relative abundance of muskrats and beavers at the Ripogenus Project by comparing with a natural reference (control) location of comparable size and shoreline characteristics (wetlands)
- Assess muskrat food availability throughout the year (e.g., cattail and bulrush)
- Determine overwinter survival and cause-specific mortality rates of muskrats and beavers
- Measure hydrology characteristics (water flows and depths) in areas of suitable habitat
- Determine use and movements of muskrats and beavers at the Ripogenus impoundment

2. MDIFW oversees the management of all furbearers across the State of Maine, and there is concern for reduced numbers of muskrats related to Project drawdowns. Since muskrats are not currently required to be tagged by trappers, we have little knowledge about the current status and population trends of this species. The majority of information that we receive about the muskrat population is gleaned from mandatory trapper surveys. The 2020-2030 Furbearer Management Plan aims to maintain healthy, abundant muskrat populations in Maine. Several important research and monitoring strategies have been identified, including developing methods to monitor the muskrat population and contributing to a regional study on the status and limiting factors for muskrats. Similarly, beavers depend on stable water levels and may be negatively impacted by large water fluctuations due to changes in access to food and houses. Many wildlife species benefit from beavers, including muskrats, so studying beaver populations in different wetland types is useful for understanding how drawdowns can impact overall biodiversity.

3. MDIFW is a cabinet level agency of the State of Maine.

4. Muskrat are culturally important to Native American tribes and are one of the most popular aquatic furbearer species to trap in the United States. Muskrat have traditionally been one of Maine's most sought-after furbearers due to their relative abundance, ease of harvest, and historic value. Muskrats have been identified as a Priority 3 Species of Greatest Conservation Need (SGCN) in Maine's Wildlife Action Plan due to their cultural significance to Native tribes and relatively recent population changes in the Northeast.

Beavers and muskrats require a permanent source of still or low-velocity water with ample emergent vegetation for forage and hiding cover. Muskrat generally do not store large quantities of food for the winter and must forage under the ice or on underground plants to survive the cold winter months. In northern areas like Maine, this means water levels must be deep enough to prevent complete freezing. Additionally, due to the structure and relative proximity of houses or pushups to water level, wetlands and waterbodies that have fluctuating,

or high seasonal levels tend to have relatively low muskrat or beaver densities. Extreme water level changes resulting from dams, precipitation, or drought events can negatively influence muskrat and beaver populations. Although muskrats are still common, there is evidence that their populations in the United States may be declining (Ahlers and Heske 2017). Perceived muskrat declines have not been linked solely to one issue, but to a compounding number of ecological and social factors. Environmental factors can alter available habitat and food, reproductive success, and mortality, all of which dictate regional muskrat population numbers. Loss of wetlands, increased predation, changing climate conditions, and disease may also have contributed to the declines. Project operations and perceived impacts on the preferred habitats of both muskrats and beavers warrant further study.

5. While the effects of dam operations, especially lake drawdowns, are well known on adjacent wetlands and near-water breeding birds, information regarding impacts of drawdowns to aquatic furbearers are not as well known. Some limited studies assessing the impacts of project drawdowns have been conducted elsewhere in Maine (e.g. Flagstaff and Indian Pond Projects), but the magnitude and duration of annual drawdowns, shallower bathymetry, and differences in site-specific shoreline characteristics of the Ripogenus impoundment make meaningful comparisons difficult.

6. MDIFW envisions a two-phased approach to this study request, with actual survey methodology to be finalized with the Licensee. Phase 1 would involve a survey of the Ripogenus Project area in the spring with emphasis on backwaters, inlets, outlets, and other wetland areas with suitable muskrat and beaver habitat. A total count of all muskrat houses, beaver lodges and food caches, and state of use (i.e. active, inactive) would be collected, and the location of each site collected via GPS. This survey would be repeated again in mid-summer, and any new activity would be documented, and locations of new activity captured via GPS. A third survey would occur with the late fall, at the onset of the icing, with observations of activity, states of use, and any new locations collected. Representative photographs of all sites will also be collected.

Concurrently, the Licensee will conduct similar surveys at a mutually agreed-upon natural reference lake(s).

Should Phase 1 surveys prove inconclusive, Phase 2 would generally follow Matykiewicz et al. 2021: a minimum of 25 muskrats and 10 beavers will be live-captured in wetland complexes during the subsequent summer field season and radio-tagged. Tagged animals will be monitored bi-monthly for the remainder of the summer and fall, and overwinter, to determine movements and document any relocations due to changing water levels, house or lodge abandonment, or causes of mortality.

7. Given the cultural and economic importance of aquatic furbearers, the level of effort and cost is commensurate with a Project the size of the Ripogenus Project and the likely license term. Given the size of the impoundment and its associated IWWHs, as well as the remote location, the field data collection component of this study will require substantial time and effort. Phase 1 field work and data analyses/reporting will take an entire field season; if Phase 2 is necessary, giving the proposed tagging and monitoring it is expected that moderate to high effort will be necessary.

References

Ahlers A. A. and E. J. Heske. 2017. Empirical evidence for declines in muskrat populations across the United States. J. of Wildlife Management 81(8): 1408-1416.

Matykiewicz, B. R., S. K. Windels, B. T. Olson, R. T. Plumb, T. M. Wolf, and A. A. Ahlers. 2021. Assessing translocation effects on the spatial ecology and survival of muskrats Ondatra zibethicus. Wildlife Biology 2021(2): 1-11.

## Fisheries Study Requests

### Study Request 8: Landlocked Salmon Habitat Use/Spawning Study—Penobscot Mills Project

1. This study will document the seasonal movement of landlocked salmon in the North Twin impoundment area (includes Ambajejus, Pemadumcook, North Twin, South Twin, and Elbow Lakes) as well as identify salmon spawning areas.

Objectives:

- Identify landlocked salmon spawning areas within the North Twin impoundment, and determine effects of Project drawdowns on spawning
- Determine the effects of annual Project drawdowns on the movement and behaviors of landlocked salmon in the impoundment
- Track seasonal movements and behaviors of landlocked salmon (within and between the five connected lakes) via radiotelemetry
- Assess tributary access and conduct tributary redd counts utilizing information obtained from tagged salmon movements
- Collection of biometric data to characterize landlocked salmon population dynamics

This study is being requested by MDIFW because currently data is lacking documenting the exact locations of spawning for landlocked salmon at the North Twin impoundment area. It is conventional thought salmon use larger tributaries of North Twin for spawning, particularly Nahmakanta Stream (Pemadumcook Lake) and the West Branch Penobscot River (Ambajejus Lake inlet). However, the North Twin impoundment is nearly 18,000 acres with numerous smaller tributaries in the impoundment which contain documented spawning habitat, yet it is unknown if salmon have the ability to access these tributaries for spawning.

2. MDIFW is the State Agency responsible for managing the inland fishery resources in Maine. The lakes within the North Twin impoundment are managed primarily for brook trout, landlocked salmon, lake trout, and rainbow smelt. Populations of these species are maintained through a combination of annual stocking (brook trout), semi-annual stocking (lake trout), and natural reproduction (landlocked salmon).

3. MDIFW is a cabinet-level agency of the State of Maine.

4. The North Twin Development operates as a store-and-release facility. From August 22 to October 15, the impoundment is maintained above elevation 488.42 feet (within 3.5 feet from normal full pond elevation). From October 15 to the start of the freshet, the impoundment elevation is gradually reduced to a lower target elevation of 479.42 (12 feet from normal full pond elevation) to provide storage for winter thaw and spring flows. MDIFW is not aware of any previous studies or data summaries focused on landlocked salmon movement and spawning habitat/tributary use as related to the North Twin impoundment in particular, nor the Penobscot Mills Project in general. This information would be invaluable to the Department's efforts of managing a (in recent years) naturally reproducing population of landlocked salmon to maintain a quality fishery in the nearly 18,000-acre North Twin impoundment.

5. Landlocked salmon were historically stocked periodically in the North Twin impoundment by MDIFW for 17 of the 36 years between 1937 and 1973, then annually from 1976 to 2010, and 2014-2017. A continuously decreasing number of salmon were stocked during the 2014-2017 timeframe. Stocking of landlocked salmon ended in 2017 after MDIFW gill net surveys at the time indicated a large percentage of captured salmon were of naturally reared origin. Presently, landlocked salmon in the North Twin impoundment consist of a self-sustaining naturally reproducing population relying on adequate and accessible spawning habitats. The Department is continuously striving to improve the salmon fishery to a healthy balance, and with that maintain an equally healthy population of rainbow smelt, the primary prey species of landlocked salmon. As outlined in the PAD, under the current operating license issued in 1996, Article 408 required the Licensee to maintain the North Twin impoundment at a minimum target level of 488.42 feet for the period August 22 through October 15 to accommodate lake trout spawning and incubation in October. However, after periodic lake trout monitoring during the early 2000's, it was determined wild lake trout reproduction was not occurring in the impoundment. Therefore, Article 408 was amended in 2012 to remove the minimum target lake elevation level during the period August 22 through October 15. With the minimum target lake elevation now removed, MDIFW believes that the Project's seasonal drawdown cycles could have a negative impact on landlocked salmon spawning and incubation within the impoundment and its tributaries. This study will also assist MDIFW on how best to manage the fishery and determine if significant lake level drawdowns are impacting salmon life movement, foraging, or spawning within the shoreline or movement up tributaries within the Project.

6. Radiotelemetry studies are routinely requested and utilized during the hydro relicensing process in Maine and elsewhere. Similar radiotelemetry studies have been proven essential to developing management plans for the Rapid River and West Branch fisheries, and similar studies at Moosehead Lake above the East Outlet Dam (FERC No. P-2671), Brassua Lake above the Brassua Dam (FERC No. P-2615), and in the Kennebec River downstream of Indian Pond Project (FERC No. P-2142) have been completed in recent years. The proposed study may be similar to other projects occurring at other hydroelectric projects but should include a sample size large enough to fully assess all movements including regular tracking events. Radiotelemetry is a highly effective means of determining salmonid movement and habits and determining potential Project-related impacts to their populations.

7. This study is commensurate with the scale of the Project, presumed new 40-year operating license, and the importance of the resource. The level of effort and cost, to include multi-season

sampling, is consistent with an impoundment of this magnitude. MDIFW needs a better understanding of the movement and spawning of naturally reared landlocked salmon fisheries in the North Twin impoundment and how the Project may or may not be impacting these fisheries to achieve MDIFW management goals.

**Study Request 9: Minimum Flow Analysis of Back Channel**

1. The goal of this study is to inform the decision process for determining the best timing and extent of minimum flow releases required to maximize fishery resources in terms of both aquatic habitat and fishable opportunities in the Back Channel (mainstem West Branch of the Penobscot River). The objectives of this study are to:

- Generate a comparative analysis of the various scenarios for minimum flow levels that best addresses and/or maximizes the needs of inland fisheries resources of the Back Channel.
- Evaluate how various minimum flows influence the fishable aquatic habitat in the various lotic and lentic reaches of the Back Channel.

2. The study is requested to ensure that any agreed upon minimum flow releases occur at levels that meet inland fisheries needs. The amounts of minimum flow releases are required to maximize aquatic freshwater fisheries habitat and fishable habitat, as well as maximize benefits to the aquatic macroinvertebrate community.

3. MDIFW is a cabinet level agency of the State of Maine.

4. Under the existing FERC license, minimum flows are not required in the Back Channel. The Back Channel is a 4.5-mile-long reach downstream of Stone Dam (Millinocket impoundment) that flows into Shad Pond. An Instream Flow Incremental Methodogy (IFIM) study was conducted using a transect-based Physical Habitat Simulation (PHABSIM) hydraulic model at 2 sites: one site located above Grand Falls, and another located below the Falls. However, at the time the only species that was evaluated in the Back Channel was Atlantic salmon.

Due to changing MDIFW fisheries goals and growing angler pressures in the region, MDIFW is trying to establish a seasonal put-and-take fishery in this resource to provide more angler opportunities. Given changing MDIFW management objectives for this resource since the original license was issued, MDIFW requests that minimum flows be re-evaluated at the Back Channel.

5. Minimum flow provisions are commonly required for hydropower operations in relation to how they impact the quality and quantity of aquatic habitat, fish passage, and/or recreational use of the site (e.g. wadability). An evaluation of minimum flow provisions is necessary to determine how best to meet the various resource needs including those of the Licensee, which may not be consistent among the various agencies and other interested parties. These data will inform conclusions regarding impacts to aquatic habitat to determine whether modifications to Project operations are needed. Data derived from this study will facilitate evaluation of the existing minimum flows, inform MDIFW's decision process, and contribute to the development

of an administrative record in support of protection and enhancement opportunities for freshwater fisheries and the aquatic community at large.

6. Minimum flow evaluations are commonly requested for hydropower project relicensing. This study request may parallel other agency flow study requests and should be a collaborative effort between MDIFW, other interested agencies, and the Licensee. Therefore, the study details, including the actual methodology, should be developed after a review of all study requests to minimize redundancy and meet the collective need for flow analyses. However, for the purpose of more clearly addressing expectations, MDIFW proposes one option of evaluation as calculating the Aquatic Base Flow (ABF, as calculated per current U.S. Fish and Wildlife Service methodology). MDIFW and interested resource agency staff, along with the Licensee, could then visually rate flow(s) with the intent of identifying a minimum flow that will enhance aquatic habitat and recreational opportunities below the dam. The actual test flows would be selected through a collaborative process involving MDIFW, other interested agencies, and the Licensee. Other types of methodologies might also be acceptable, including replicating the Instream Flow Incremental Methodology employing a Physical Habitat Simulation Model to quantify flow and habitat relationships, and the development of Weighted Usable Area outputs to characterize habitat suitability for landlocked salmon.

7. The level of effort and cost is commensurate with a project the size of the Penobscot Mills Project and the likely license term. The field work will likely require at least one field season to complete. Several days of field work and subsequent analyses may be needed to assess pre-determined locations of the river under various minimum flows. Only an evaluation of various minimum flow scenarios, whether modeled or conducted ***in situ*** can effectively determine the best approach for addressing flow releases for the Project.

**Study Request 10: Macroinvertebrates Study Request—Ripogenus Project**

1. The goal of this request is to determine if any changes have occurred in the macroinvertebrate species composition and/or abundance at the Ripogenus Project since the original study.

2. MDIFW is the natural resource agency responsible for managing fish and wildlife resources along the West Branch of the Penobscot River, with "wildlife" defined as all animals including insects and other macroinvertebrates. Macroinvertebrates are important forage for all fish species in the Project area.

3. MDIFW is a cabinet-level agency of the State of Maine.

4. GLHA performed extensive studies of macroinvertebrates in the Ripogenus impoundment and the West Branch of the Penobscot River below McKay Station for the current license. This information can be found in Volume VIII of the 1991 application.

5. There is concern that there are more frequent and more severe drawdowns on Ripogenus impoundment than anticipated, and they are occurring during the typical growing season. The extensive dewatered areas could be impacting macroinvertebrate populations and therefore negatively impacting fish growth and survival. In addition, there is concern that the West Branch of the Penobscot River below McKay Station is managed as more of a peaking operation

with flows exceeding 3,000 cfs during the day and 1,800 cfs or less in the evenings. Flow changes of this magnitude in a short period of time can dewater areas of the river and result in a loss of macroinvertebrate diversity and habitat, as well as cause direct mortality.

MDIFW believes the summer drawdowns and peaking operations were not fully anticipated in the review of the current license and therefore the water management plan may need to be refined. This study, along with the requested lake elevation and flow data, will provide information about the degree, frequency, and possible impacts resulting from the drawdowns and changes in flow.

6. Assuming there have been no changes to sampling methodology, MDIFW recommends using the exact same protocols from the 1991 application which were accepted by FERC and the agencies. We recommend the sampling take place in the same locations in the Ripogenus impoundment and the section of river between McKay Station and Ambajejus Lake. We request the Licensee report the results along with a comparison to the data presented in the 1991 application.

7. The level of effort and cost is commensurate with a Project the size of the Ripogenus Project and the likely license term. There are no proposed alternative studies, although MDIFW envisions that this request can be incorporated into other study requests.

Finally, MDIFW supports study requests prepared by other natural resource agencies, including but not limited to the Maine Department of Environmental Protection, the Maine Department of Marine Resources, the Maine Department of Agriculture, Conservation, & Forestry, and the US Fish and Wildlife Service.

Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,



John Perry
Environmental Review Coordinator

Cc: Francis Brautigam, Joe Overlock—MDIFW Fisheries Division, Augusta Headquarters
Tim Obrey, Jeff Bagley—MDIFW Fisheries Division, Region E
Kevin Dunham, Kevin Gallant—MDIFW Fisheries Division, Region F
Nathan Webb, Ryan Robicheau—MDIFW Wildlife Division, Augusta Headquarters
Craig McLaughlin, MDIFW Wildlife Research and Assessment Section Supervisor
Danielle D'Auria, Shevenell Webb, Derek Yorks, Beth Swartz, Phillip deMaynadier—MDIFW Wildlife Research and Assessment Section
Doug Kane, Scott McLellan—MDIFW Wildlife Division, Region E
Mark Caron, Allen Starr—MDIFW Wildlife Division, Region F
Casey Clark, Gail Wippelhauser—MDMR

Kathy Howatt, Christopher Sferra—MDEP
Julianne Rosset, USFWS
Jeff Murphy, NMFS

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04333-0021

JANET T. MILLS
GOVERNOR

PATRICK C. KELIHER
COMMISSIONER

October 8, 2021

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

**RE: Pre-Application Document Comments, Study Requests, and Scoping Document Comments for the Ripogenus (FERC No. 2572-133) and Penobscot Mills (FERC No. 2458-247) Hydroelectric Projects**

Dear Secretary Bose:

The Maine Department of Marine Resources (MDMR) is writing in response to the Federal Energy Regulatory Commission's (Commission) Notice of Intent to File License Application, Filing of Pre-Application Document (PAD), Commencement of Pre-Filing Process, Scoping, Requests and Comments on the Pad and Scoping Document, and identification of issues and Associated Study Request, dated June 11, 2021, for the Ripogenus and Penobscot Mills Hydroelectric Projects (collectively referred to as Projects), located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot Counties, Maine. The projects are operated by Great Lakes Hydro America, LLC (GLHA).

## A) Project Background

### Riponenus Project

The Ripogenus project is located on the West Branch of the Penobscot River and the Project includes an 83-foot-high and 795-foot-long dam consisting of two concrete ogee spillway sections totaling approximately 480 feet in length, a 37-foot-wide intake structure, a 178-foot-long gate section, and a 100-foot-long earth section. The project facilities create a 29,270-acre impoundment that extends approximately 20.8 miles upstream with a normal full pond elevation of 941.59 feet United States Geological Survey (UGSS) datum. The impoundment created by the project facilities totals 688,705 acre-feet of usable storage with a maximum drawdown of 44 feet and encompasses the following lakes and ponds: Ripogenus, Caribou, and Chesuncook Lakes; Black, Brandy, and Moose Ponds.

The Ripogenus project also includes a 16-foot-diameter and approximately 3,850-foot-long tunnel, penstocks, a powerhouse (McKay Station) with three vertical Francis turbines with a total authorized capacity of 37,530 kW, and 50-foot-long excavated bedrock tailrace. Water that is diverted through the tunnel bypasses the river reach of the West Branch known as the “Upper Gorge” and instead flows

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through the 2-5/8 inch clear spaced trashracks of the intake structure at the Ripogenus Dam, to McKay Station via the tunnel, through the turbines, and is discharged via the excavated tailrace. The tailrace enters the main river channel at an approximately 90-degree angle. The hydraulic capacity of McKay Station is 3,500 cfs.

The Ripogenus project contains one utility-scale battery energy storage site.

**Penobscot Mills Project**

The Penobscot Mills project consists of four hydropower developments (North Twin, Millinocket, Dolby, and East Millinocket) located on the West Branch and one storage development (Millinocket Lake) located on Millinocket Stream. The total authorized installed capacity of the Penobscot Mills Project is 67.9 MW

*Millinocket Lake Storage Development*
The Millinocket Lake Storage Development consists of a 635-foot-long and approximately 18.8-foot-high concrete and earth-filled dam located at the outlet of Millinocket Lake and a pumping station containing two pumps, two 4.5-foot-diameter steel pipes measuring approximately 544-feet-long, and a concrete outlet structure discharging into Ambajejus Lake (within the North Twin impoundment). The dam includes a 19-foot-long spillway section and an adjacent 58-foot-long gated section that contains four lift gates and one log sluice gate. The normal full pond elevation of the lake is 480 feet with a surface area of approximately 8,640 acres. According to GLHA, usable storage is 45,370 acre-feet with a 6.2-foot drawdown.

*North Twin Development*
The North Twin Development consists of a 1,051-foot-long and approximately 35-foot-high concrete and earth-filled structure at the outlet of Elbow Lake. The dam includes a 114-foot-wide intake structure and powerhouse, a 34-foot-wide fishway "for resident fish species", a 117-foot-long tainter gate section, and a 286-foot-long earthen embankment. In addition to the dam, there are a series of six earthen dikes having a combined length of 2,530 feet, located upstream of the dam, which retain water. The North Twin impoundment has a normal full pond elevation of 491.92 feet with a surface area of 17,790 acres and includes: Elbow, South Twin, North Twin, Pemadumcook, and Ambajejus Lakes. According to GLHA, the impoundment's usable storage is about 344,355 acre-feet with a drawdown of 22 feet. Of note, the Millinocket Lake Development includes a pumping station that conveys water from Millinocket Lake and is discharged to Ambajejus Lake, which is included the impoundment for the North Twin Development.

The intake structure to the North Twin powerhouse includes nine water passages, each 8 feet wide by 13 feet high and equipped with a steel gate to control the flow of water to the turbines. Trashracks constructed of 3/8-inch bar still with 2-5/8-inch clear bar spacing are located on the upstream side of the intake structure of the powerhouse. The North Twin powerhouse includes two fixed-blade vertical turbines in addition to a Kaplan turbine with an adjustable blade runner with a total rated capacity of 7,012.5 kW and a total hydraulic capacity is 4,500 cfs. The powerhouse also includes six tailrace bays with a combined width of 104 feet that conveys water back into the West Branch.

*Millinocket Development*
The Millinocket Development consists of a 1,262-foot-long concrete gravity dam ("Stone dam") located at the outlet of Quakish Lake. The dam directs water away from the West Branch and into the western

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canal which leads to Ferguson Pond and eventually Millinocket Stream. The concrete dam consists of a 300-foot-long overflow spillway section with no flashboards, a 358-foot-long spillway section with 30-inch-high flashboards a 52-foot-wide waste gate structure; a 428-feet, 5-inch-long spillway with a 2.75-foot-high rubber inflatable dam; and a 124-foot-long gatehouse. The gatehouse is used to regulate the flow into the western canal, which conveys water from Quakish Lake to Ferguson Pond. The western canal is approximately 150 feet wide and 1,400 feet long. The trashracks for the six 10-foot diameter penstocks have a clear spacing of 2-7/8 inches, while the trashracks for the single 11-foot diameter penstock have a clear spacing of 2-1/2 inches. There are eight horizontal Francis turbines at the project. According to GLHA, Unit 2 is "currently out-of-service and, therefore, is not included in the total rated capacity or hydraulic capacity of the station; however, GLHA routinely evaluates rehabilitation of the unit based on market conditions and other factors." Excluding Unit 2, the total rated capacity of the station is 37,374.8 kW and the total hydraulic capacity is 4,305 cfs. Water exits the turbines through seven, 25-foot-wide tailrace bays discharged directly into Millinocket Stream.

*Dolby Development*

The Dolby Development consists of a 1,395-foot-long and approximately 56-foot-high concrete and earthen dam that crosses the West Branch at the outlet of Dolby Pond. The project includes an approximately 4.2-mile-long impoundment with a normal full pond elevation of 336.2 feet with a surface area of 2,048 acres. The project dam includes a 27-foot-long concrete abutment, four spillway sections with a total length of 521 feet, two 6-foot-long abutments, a 76-foot-wide waste gate, a 209-foot-wide intake with an integral powerhouse, and 300-foot-long and 250-foot-long earthen dikes. The intake structure for the Dolby Development contains nine water passages that convey water to the four operable turbines. Eight sets of trashracks extend 174 feet across the upstream side of the intake structure. The trashracks for bays 2 through 4 are 3/8-inch bar steel with 1-5/8-inch clear bar spacing., while the trashracks for bays 5 through 8 are 3/8-inch bar steel 2-5/8-inch clear bar spacing. The powerhouse contains three inclined Kaplan turbines and one vertical, fixed-blade turbine (Units 5, 6, 7 and 8) with a total authorized installed capacity of 16,513 kW and a total hydraulic capacity of 4,750 cfs. According to GLHA, "the turbine-generators located in the No. 1, 2, 3, and 4 bays have been removed from service…however, GLHA routinely evaluates rehabilitation of these units based on market conditions and other factors." Water exits the four operable turbines through four tailrace bays (5, 6, 7, and 8) into a 189-foot-wide tailrace. According to GLHA, "Bays No. 1, 2, 3, and 4 are no longer used."

*East Millinocket Development*

The East Millinocket Development is located approximately 1.7 miles upstream of the Medway project (FERC No. 2666) on the West Branch. The Project consists of a 717.5-foot-long and approximately 31-foot-high concrete and earth dam with two spillway sections measuring 212 feet and 154 feet, a 59-foot-wide waste gate structure, 7-foot-wide timber crib section, 23-foot-wide sluice gate, and a 146-foot, 6-inch-wide intake structure integral with the powerhouse. The impoundment extends from the dam 1.9 miles upstream to the tailwater of the Dolby Dam. The surface area of the impoundment is 128 acres at normal pull pond elevation of 287.2 feet. The intake contains 12 gate openings that lead to 6 covered flumes in which the six horizontal Francis turbines are located. The trashracks are located immediately upstream of the gate openings and are 3/8-inch bar steel with 1-1/4-inch clear bar spacing. The total authorized capacity of the project is 6,975 kW and the total hydraulic capacity is 4,200 cfs.

*Protection, Mitigation, and Enhancement Measures*

There are no fish passage facilities associated with the Ripogenus Project. There is one fishway associated with the North Twin Development, but no other fish passage facilities associated with the other facilities for the Penobscot Mills Project. GLHA has not proposed additional protection,

mitigation, or enhancement (PME) measures at any of the facilities included in the licenses for the Ripogenus Project or the Penobscot Mills Project.

**COMMENTS on PAD**

*1.4 Post-ECPA Relicensings*

The PAD states,

> "The previous relicensing of the Projects was a massive undertaking that exhaustively studied and modified many aspects of the Projects' original licenses. Additionally, subsequent to the issuance of the licenses in 1996, significant additional monitoring occurred at both Projects to evaluate the success of the measures required by the licenses.
> As a result, the Projects operate under an array of highly beneficial and effective PM&E measures that enhance aquatic and terrestrial habitats throughout the Project areas, while serving as a critical component for the seasonal management of water flows throughout the Penobscot River Basin. These PM&E measures comprehensively address resource interests specific to the Project areas, as well as the larger river basin. These interests include water quality; management and balancing of flows within and downstream of the West Branch; aquatic and terrestrial resources; whitewater and recreational opportunities; cultural resources; and land management."

While the previous relicensing and subsequent additional monitoring resulted in PME measures at the Projects, these measures patently neglected to address impacts to diadromous fish with historic habitat within the project areas. The Project areas include historic habitat for Atlantic Salmon, American Shad, alewife, Blueback Herring, Sea lamprey, and American Eel. All of these species, except American eel, have been excluded from the Project area by the lack of fish passage at the Project facilities. MDMR looks forward to this relicensing addressing this oversight.

*4.3 Existing Project Facilities*

According to GLHA, "Water exits the four operable turbines through four tailrace bays into a 189-foot-wide tailrace. Bays No. 1, 2, 3, and 4 are no longer used." While GLHA is clear that the tailraces bays associated with the inoperable units are no longer used, it is not clear if the intake structures for those units are still in use. MDMR requests GLHA clarify which intake bays are in use at the Dolby Development. In addition, GLHA provided detail on the trash rack structures for Bays 2-8. MDMR requests GLHA provide detail on the trash rack structure for Bay 1 at the Dolby Development.

Shad Pond and the section of the West Branch of the Penobscot River upstream of Shad Pond to the Millinocket Development Dam are depicted in Figure 4.2 and were described in the during the Scoping meeting on September 9, 2021, as the "back channel". MDMR requests that the term "back channel" be removed from the PAD. This term causes confusion as it misrepresents this section of the river, which is the only channel of the West Branch of the Penobscot River. This channel is the West Branch of the

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Penobscot River. MDMR recommends the term "West Branch of the Penobscot River below the Stone Dam" be used in its place.

*4.4 Project Operations*

The PAD did not contain adequate information to describe fluctuation in surface elevations in the impoundments of the Projects. MDMR requests that the Licensee include a summary of data on the surface elevation of the impoundments for each of the Projects. This data should include average, minimum, and maximum elevations for each of the impoundments and when they occurred and should be reported yearly for the previous 20 years of operation under the current licenses.

In addition, MDMR requests similar information on the operations of the pumping station included in the facilities for the Millinocket Lake Storage Development. This data should include amount, duration of dailing pumping operations and should be reported for the previous 20 years of operation under the current licenses.

*5.3.2 River Flows*

The PAD provides a summary of flow data (monthly average outflow 2016-2020), however this summary is not adequate to assess flow through the Project area and the impact of Project operations on flow. In addition, no third-party flow data is available for the West Branch of the Penobscot River. The nearest USGS gauge station is located near the West Enfield Project (FERC No. 2600), which is more than 30 miles below the Projects and below the confluence of several tributaries on the mainstem of the Penobscot River. MDMR requests GLHA provide detailed daily data for flows, head pond elevations, and operations for each of the Project facilities reported for the previous 20 years of operation under the current licenses. Without the disclosure of data, the impacts of the current operation of the Projects are difficult to assess. In addition, without the disclosure of data on how the Projects have been operated in recent years, it is difficult to determine if the projects are operating under "store-and-release" or "peaking" modes. These changes in operations have impacts on water temperature and other water quality measures in the habitats within the Project area and downstream of the Projects and has the potential to negatively impact ESA listed Atlantic salmon and other aquatic species and habitats. Energy demands have changed dramatically since the Projects were licensed due to the closer of the Mills. These changes have led to changes in Project operations.

This request from MDMR is for data that is already available to the Applicant and thus is not included our study requests.

*5.4 Fish and Aquatic Resources*

The PAD states, "The Penobscot River basin supports a variety of diadromous fish species including Atlantic salmon, American shad, alewife, and blueback herring (collectively referred to as river herring),

American eel, and sea lamprey during some portion of their life histories. None of these species currently occur in waters of the Ripogenus or Penobscot Mills Projects, except for the catadromous American eel. The West Branch is not currently managed for anadromous fish."

The West Branch of the Penobscot River contains historic habitat for Atlantic Salmon, American shad, American Eel, Alewife, Blueback herring, and Sea Lamprey. American eel are also currently present in the Project impoundments. As stated in the 2008 Strategic Plan for the Restoration of Diadromous Fishes to the Penobscot River (2008 Plan), "…the 10 hydropower and water storage dams on the West Branch Penobscot do not pass diadromous fish and no passage is planned in the near term."[1] The lack of upstream and downstream passage measures at relevant Project facilities has prevented active restoration of diadromous species to the West Branch of the Penobscot River. In other words, the West Branch Penobscot is not currently managed for anadromous fish because of the lack of passage at the Project facilities. Significant progress on restoration goals laid out in the 2008 Plan have been met in the years since its writing. While the 2008 Plan did not target the West Branch for restoration at the time, that does not mean that restoration should not happen in the future.

*American Eel (Anguilla rostrata)*

As indicated in the PAD, "American eel have been found in each of the Project impoundments." In fact, American eel were documented as part of the fish assemblage catches from the previous relicensing of the Project[2]. However, in the intervening years there have been no upstream or downstream passage facilities or operational measures installed or implemented at any of the Project facilities. In addition, no studies have been completed to inform Project specific information related to impacts to American eels. To address these data needs, MDMR includes study requests in this filing that seek to address the following gaps in information.

- Where do juvenile eels concentrate below each dam?
- What is the timing and number of eels that approach each facility and at what size do they migrate through the relevant Project facilities?
- What is the mortality for each potential route of passage for downstream migrating adult eels?
- What are the downstream passage alternatives that best meet the standards of safe, timely, and effective?

[1] Maine Department of Marine Resources and Maine Department of Inland Fisheries and Wildlife. 2008. Strategic Plan for the Restoration of Diadromous Fishes to the Penobscot River. 108 pp.
[2] Federal Energy Regulatory Commission (FERC). 1996. Final Environmental Impact Statement Upper Penobscot River Basin Maine, Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458). Federal Energy Regulatory Commission, Public Reference and Files Maintenance Branch, Washington, DC.

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*American Shad (Alosa sapidissima)*

American shad habitat in the West Branch of the Penobscot River was documented well before the development of the Project[345]. As stated in the PAD, "the segment of the West Branch between the Mattaceunk Project (FERC No. 2520) Dam and Grand Falls accounts for 1.7 percent of the Penobscot River basin's potential American shad production." This equates to production potential of approximately 25,773 adult shad annually based on the 9,372 units of habitat (1 production unit is 100 $m^2$).

Currently, there are no upstream or downstream passage and protection measures installed at the Project facilities for American Shad. MDMR includes in this filing study requests that seek to addresses gaps in information that will be needed to develop PME measures for American Shad.

*Atlantic Salmon (Salmo salar)*

Atlantic salmon historically occurred throughout the Penobscot River basin including in the West Branch of the Penobscot River as far as Penobscot Brook on the South Branch as well as in the North Branch[6]. Compared to other tributaries of the river, the West Branch includes a significant amount of high-quality Atlantic salmon habitat. In addition, critical habitat for Atlantic salmon extends to just below the Project areas, the confluence of the West Branch with the East Branch Penobscot River.

Currently, there are no upstream or downstream passage and protection measures installed at the Project facilities for Atlantic salmon. MDMR includes in this filing study requests that seek to addresses gaps in information that will be needed to develop PME measures for Atlantic salmon.

*Other Diadromous Species*

The PAD does not include any information on Alewife (*Alosa pseudoharengus*), Blueback herring (*Alosa aestivalis*), or Sea Lamprey (*Petromyzon marinus*) within the Project area. The upstream migratory extent for Alewife and Blueback herring is documented as similar to that of American Shad, indicating that Grand Falls was likely the first natural barrier to migration[78]. This indicates that Dolby Pond, Shad Pond, and Millinocket Lake were all historic habitat for Alewives and the associated riverine habitat for Blueback herring. Given the lack of natural barriers and the similarities in upstream

[3] Foster, N.W. and C.G. Atkins. 1868b. Reports of the Commissioners of Fisheries of the State of Maine for the Years 1967 and 1868: First Report 1867. Owen and Nash, Printers to the State, Augusta.
[4] Atkins, C.G. 1870. Fourth Report of the Commissioner of Fisheries of the State of Maine for the year 1870. Owen and Nash, Printers to the State, Augusta.
[5] Stillwell and Smith 1879
[6] Atkins, C.G. 1870. Fourth Report of the Commissioner of Fisheries of the State of Maine for the year 1870. Owen and Nash, Printers to the State, Augusta.
[7] Atkins, C.G. 1887. The River Fisheries of Maine. In: Goode, B.G. et al. The Fisheries and Fishery Industries of the United States., Section V, Volume 1, pages 673-728.
[8] Saunders, R. M. A. Hachey, C.W. Fay. 2006. Maine's Diadromous Fish Community: Past, Present, and Implications for Atlantic Salmon Recovery. Fisheries 31(11):537 - 547.

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migration behavior and spawning habitat between Sea Lamprey and Atlantic salmon, it is assumed that Sea Lamprey had a similar historic extent as salmon in the West Branch[9].

Currently, there are no upstream or downstream passage and protection measures installed at the Project facilities for Alewife, Blueback herring, or Sea Lamprey. MDMR includes in this filing study requests that seek to addresses gaps in information that will be needed to develop PME measures for Alewife, Blueback herring, or Sea Lamprey.

*5.7.5 Biological Opinions, Status Reports, and Recovery Plans for Listed Species*

The PAD states, "Several biological opinions, status reports, and recovery plans have been developed for Atlantic salmon; however, Atlantic salmon are not found within the Project waters, as they are concentrated in the mainstem Penobscot River, East Branch Penobscot River, and other tributaries downstream of the Projects." Salmon are not present within the project area because of the lack of fish passage at the projects, which has impacted this endangered species as well as other diadromous species. This impact is clearly articulated in the 2019 Atlantic Salmon Recovery Plan (USFWS and NOAA)[10].

> "Damming rivers, thus preventing migration to former spawning grounds, was a major factor in the decline of Atlantic salmon, sturgeon, river herring (blueback herring and alewife), and shad."

*5.7.6 Federally-Designated Critical Habitat for Listed Species*

While the West Branch of the Penobscot River was not included in critical habitat for GOM DPS of Atlantic salmon, the West Branch is well documented as historic habitat for the species. As climate change continues to impact habitat downstream of the Projects, habitat in the West Branch may be an important asset to recovering Atlantic salmon in the future.

*RECOMMENDED STUDIES*

GLHA is not proposing to undertake any studies as part of this relicense proceeding. Enclosed please find our formal study requests (Attachment A) in the format required pursuant to 18 CFR §4.38(b)(5). In addition, MDMR supports the study requests of Maine Department of Environmental Protection, Maine Department of Inland Fisheries and Wildlife, U.S. Fish and Wildlife Service (Accession No. 20211007-5023), and NOAA Fisheries (Accession No. 20211008-5254).

[9] Nislow, K. H., and B. E. Kynard. 2007. The ecological role of Sea Lamprey in freshwater streams of the North Atlantic basin. in A. Haro, editor. Challenges for Diadromous Fishes in a Dynamic Global Environment. American Fisheries Society, Halifax, NS.

[10] U.S. Fish and Wildlife Service and NMFS. 2018. Recovery plan for the Gulf of Maine Distinct Population Segment of Atlantic salmon (Salmo salar). 74 pp.

Thank you for the opportunity provide comments on the Ripogenus and Penobscot Mills Projects. Please contact Casey Clark (casey.clark@maine.gov) with any questions.

Sincerely,



Patrick C. Keliher, Commissioner

cc: Sean Ledwin, MDMR
John Perry, MIF&W
Kathy Howatt, DEP
Amanda Cross, USFWS
Jeff Murphy, NMFS

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## Attachment A

### Study Requests

1. Three-Dimensional Computational Fluid Dynamics (CFD) Modeling Upstream and Downstream of the Discharge and in the Vicinity of Powerhouse Forebays
2. Upstream Juvenile Eel Assessment
3. Downstream American Eel Passage Assessment:
4. Downstream Passage Alternatives Study
5. Upstream Passage Alternatives Study
6. Evaluation of the Size of American Eels and the Timing of their Downstream Migratory Movements

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# Study Request #1
# Three-Dimensional Computational Fluid Dynamics (CFD) Modeling Upstream and Downstream of the Discharge and in the Vicinity of Powerhouse Forebays

***Goals and Objectives***

The goal of this study is to determine the flow field conditions that exist upstream of the project powerhouse under existing condition and potential future conditions. The information from this study can be coupled with data from our other requested studies of downstream passage to develop a comprehensive understanding of migratory fish behavior. The objective of this study is to develop a series of layered drawings that show velocity magnitudes at discharges that have been agreed upon by the resource agencies and the licensee. We request that the following three flow conditions be studied at the minimum: a) river flow at powerhouse capacity, no spill; b) river flow at 50% powerhouse hydraulic capacity, no spill; and c) river flow at 20% exceedance on the May through October flow duration curve with the powerhouse operating at capacity and excess flow being spilled either through gates or over the spillway. The CFD modeling should also be conducted for at least these three aforementioned conditions for each alternative studied in the Downstream Fish Passage Alternatives Study. We expect the results demonstrate velocities and flow orientations upstream of the powerhouse and along the racks.

The goal of this study is to determine the potential impacts of the East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, and the Ripogenus dams on: (1) the zone of passage for migratory fish near turbine discharge; and (2) natural flow regimes in the West Branch of the Penobscot River immediately upstream and downstream of each project.

Specific objectives of the study include:

1. Develop a CFD model of the full width of the West Branch upstream and downstream of each projects discharge.

2. Model flow characteristics upstream and downstream of the project under existing project operations and at several representative river flow levels, as well as any other modifications under consideration (including potential future impacts to operations as a result of climate change), to assess potential impacts to fish and wildlife resources.

3. Assess velocities and flow fields at, and in proximity to each project's intake/discharge structure when generating, and their potential to (1) interfere with fish migration; (2) create undesirable attraction flows; and (3) result in fish entrainment and/or impingement.

4. Assess the potential for velocity barriers to aquatic organism movement in the mainstem river resulting from generation flows at each project, alone and in combination with generation flows from the other projects on the West Branch.

5. Model, and then evaluate, flow characteristics under alternative project operations with potential measures to avoid, minimize, or mitigate impacts to fish and wildlife resources.

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6. Define flow velocities, fields/magnitudes, and direction in front of each project's powerhouse.

This information is necessary to properly assess the scale, and feasibility, of potential upstream and downstream passage alternatives (see the *Downstream Passage Alternatives* study request). The requested information can be utilized to create a more productive, cost-effective, and efficient alternatives analysis process by helping to narrow the focus to a minimal number of feasible alternatives.

***Resource Management Goals***
MDMR is a cabinet level agency of the State of Maine. MDMR was established to regulate, conserve, and develop marine, estuarine, and diadromous fish resources; to conduct and sponsor scientific research; to promote and develop marine coastal industries; to advise and cooperate with state, local, and federal officials concerning activities in coastal waters; and to implement, administer, and enforce the laws and regulations necessary for these purposes. MDMR is the lead state agency in the restoration and management of diadromous (anadromous and catadromous) species of fishes. In order to achieve the State of Maine's restoration goals for these species in the Penobscot River, the Projects must provide safe and effective passage.

***Public Interest***
The requestor is a state natural resource agency.

***Existing Information and the Need for Additional Information***
No project-specific information exists that will allow for a comprehensive assessment of existing project operations on West Branch flows and on fish and aquatic organisms in the project areas upstream and downstream of each dam. The Pre-Application Document does not contain any information, or tool(s), that will allow for predictions of impacts of alternative project operations, or potential mitigation measures to protect or enhance aquatic fish and wildlife resources. Further, a comprehensive understanding of fish behavior at each powerhouse forebay is needed to create safe, timely, and effective upstream and downstream passage for Atlantic Salmon, American shad, American Eel, Alewife, Blueback herring, and Sea Lamprey on the West Branch. CFD models are a relatively cost-effective way to analyze existing and future conditions. As such, changes in the amount of attraction water, changes in which turbines are operating, and which spillway gates are releasing water can all be examined.

MDMR notes, modeling this information now can help the resource agencies, as well as the Applicant, account for potential drought and/or flood related scenarios that might occur during the duration of any newly issued license, due to climate change and other factors.

***Nexus to Project Operations and Effects***
The Ripogenus Project has direct impacts to instream flows, aquatic habitats, and upstream and downstream migrating Atlantic salmon, American eel, and Sea Lamprey in the West Branch of the Penobscot River. The Penobscot Mills Project has direct impacts to instream flows, aquatic habitats, and upstream and downstream migrating Atlantic Salmon, American shad, American Eel, Alewife, Blueback herring, and Sea Lamprey in the West Branch of the Penobscot River. The development of the requested CFD models will aid in determining the potential impacts of the East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, and Ripogenus dam. For downstream passage, the U.S. Fish and Wildlife Service (FWS) has velocity vector guidelines associated with intake racks and guidance

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screens; the output from these models will inform the resource agencies under what conditions appropriate velocities are being met and when they are being exceeded. Additionally, modeling of flow will aide in our interpretation of year one downstream passage telemetry results. Therefore, aspects of the CFD modeling effort could focus on the locations identified as important in the study results and GLHA could assess changes to structures of operations and evaluate them in the model. Suitable alternatives would then be tested in year three studies.

***Methodology Consistent with Accepted Practice***

A three-dimensional CFD model has become an increasingly common standard of analysis at hydroelectric projects across the nation. Within the northeast region, we have seen these types of models developed at the Holyoke (P-2004), Brunswick (P-2284), Shawmut (P-2322), Milford (P-2534) and Lowell (P-2790) projects. We would expect to engage with the licensee in terms of determining the appropriate areas and flows to be modeled. We expect the spatial extent of the model at each study site will vary. Given the large number of ways in which output from these models can be presented and the near infinite number of flows which could potentially be modeled, we would expect to consult with the applicant to reach agreed upon modeling efforts and scenarios to be examined.

***Level of Effort/Cost, and Why Alternative Studies Will Not Suffice***

The cost of developing, running, and testing a CFD model can vary tremendously; one large variable in determining the cost is based on the amount of existing bathymetric data to which GLHA currently has access. We roughly estimate the maximum cost of each CFD model to be $50,000, assuming no bathymetric data currently exists. Proactive communication with resource agencies will reduce the cost and iterative effort. Given the level of effort that has occurred at other projects where licensees have proposed to amend their license, we see the level of effort requested here as reasonable, given that GLHA is seeking a renewal of its license.

Regarding alternatives, no project-specific instream flow analysis tool has been developed for the West Branch that will allow for assessment of existing operations and alternative operational impacts on instream flow and aquatic habitat for fish and wildlife resources. Further, the model, once built, can be used to simulate flow conditions in the vicinity of each project during the migratory fish passage season and can be used together with behavior studies (i.e., telemetry studies and entrainment studies requested herein) to assess the impacts of varying project operations or potential mitigation operations and measures on fish migration and aquatic habitat. MDMR knows of no other tool that will provide for these types of assessments. No alternatives are proposed.

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## Study Request #2
## Upstream American Eel Passage Assessment

The PAD identifies American eel as present in the Project area. Dams, such as East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, and the Ripogenus dam, are known to impair migration success for catadromous species such as American eel (ASMFC 2014). Presently, upstream passage facilities specific to the needs of migrating juvenile eels are not available at either project (or any of the dams that comprise the two projects). Installing upstream eel passage at each facility will address direct project related impacts and facilitate restoration of American eel within the Penobscot River watershed. The study request below is intended to provide data necessary to develop reasonable and prudent conservation measures, specifically safe, timely and effective passage for American eel. If aspects of the project design or project operations changes with any new license, this study may need to be repeated.

***Goals and Objectives***

The goal of this study is to assess the locations for dedicated upstream passage for American eel. The study has two objectives:

1. Conduct systematic surveys of eel presence/abundance below the East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, and the Ripogenus dam to identify areas of concentration of eels staging in pools or attempting to ascend wetted structures that would potentially establish the most effective location to place upstream eel passage facilities.
2. Collect eels with temporary trap/pass devices at areas identified from surveys as potential location of eel concentrations to assess whether eels can be collected/passed in substantial numbers, and whether locations are viable sites for permanent eel trap/pass structures.

***Resource Management Goals***

MDMR is a cabinet level agency of the State of Maine. MDMR was established to regulate, conserve, and develop marine, estuarine, and diadromous fish resources; to conduct and sponsor scientific research; to promote and develop marine coastal industries; to advise and cooperate with state, local, and federal officials concerning activities in coastal waters; and to implement, administer, and enforce the laws and regulations necessary for these purposes. MDMR is the lead state agency in the restoration and management of diadromous (anadromous and catadromous) species of fishes.

The Atlantic States Marine Fisheries Commission (ASMFC) has developed three documents related to the management of American eel and hydropower facilities:

1. Interstate Fishery Management Plan for American Eel. April 2000. Atlantic States Marine Fisheries Commission.
2. Addendum II to the Fishery Management Plan for American Eel. Atlantic States Marine Fisheries Commission. Approved October 23, 2008. 8 pp.
3. Addendum III to the Fishery Management Plan for American Eel. Atlantic States Marine Fisheries Commission. Approved August 2014. 19 pp.

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Objectives of the management plan include: (1) protect and enhance American eel abundance in all watersheds where eel now occur; and (2) where practical, restore American eel to those waters where they had historical abundance, but may now be absent, by providing access to inland waters for glass eel, elvers, and yellow eel, and adequate escapement to the ocean for pre-spawning adult eel. Addendum II contains specific recommendations for improving upstream and downstream passage of American eel, including requesting that member states and jurisdictions seek special consideration for American eel in the Commission's relicensing process.

MDMR's management goal is to restore American eel to their historic habitat in the Penobscot River. The waters upstream of Projects represent significant habitat for American eel. The protection, enhancement, and restoration of this species relies on safe, timely, and effective upstream fish passage at the Projects.

***Public Interest***
The requester is a state natural resource agency.

***Existing Information and the Need for Additional Information***
The PAD does not provide information relative to areas eels concentrate below the East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, or Ripogenus dams or an assessment of the numbers and size of eels attempting to ascend each facility. Data from this study will provide information in support of the licensing process and in developing the administrative record for potential mitigation measures under Section 10(j) of the Federal Power Act.

***Nexus to Project Operations and Effects***
Dams impede the safe, timely, and effective passage of eels. The ability of eels to pass a dam depends on factors such as its height, hydraulics, presence of climbable surfaces (e.g., rough surface, wetted substrate), presence of predators, and risk of exposure to heat or drying while climbing a dam among others (Solomon and Beach 2004). Passage is also limited by the size of eel present. Only small juvenile eels are able to scale vertical surfaces (Machut et al. 2007). The design of the East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, and the Ripogenus dam creates multiple potential sites for upstream migrating eels to congregate. Site-specific data are necessary to understand project effects and support the decision process for properly designing and siting eel passage facilities.

***Methodology Consistent with Accepted Practice***
This study request consists of two parts: (a) an initial survey for presence and identification of areas where juvenile eels congregate and (b) a site evaluation for permanent eel passage. The methodologies described here are consistent with commonly accepted practices.

1. Objective 1: Systematic Surveys
Surveys of eel presence and relative abundance should be conducted at regular intervals (as described below) throughout the eel upstream migratory season (approximately April 1 to November 30). Surveys should consist of visual inspection and trapping in likely areas where eels may concentrate. Areas of quiescent water and leakage points along the downstream face of the dams should be targeted. Methods should include visual surveys (on foot, from a boat, or snorkeling) and trapping using small mesh (< 1/8" clear opening) baited eel pots. Visual surveys should be performed once per

week, at night, preferentially during precipitation events. Trap sets should be performed once per week, with an overnight soak time. Recorded data should include location, observation of eels (presence, absence, relative numbers, relative sizes, behaviors, time/date of observation), and survey method.

2. Objective 2: Trap/Pass Collections
Areas identified from the systematic surveys as having significant number of eels present should be targeted as potential areas for permanent eel trap/passes and should be initially assessed using temporary/portable trap passes. Temporary trap/passes should be purpose-designed and built for each location and operated throughout the eel upstream migratory season in the year following the survey. Ramp-type traps with supplementary attraction flow are preferred temporary trap/pass designs (Solomon and Beach 2004). Traps should operate daily, with catches quantified every 2-3 days. Data recorded should include location, trapping interval, absolute numbers of eels trapped, relative eel sizes, and hydraulic and environmental conditions during the trapping period.
All collected eels from surveys should be released at their point of capture; those eels collected from trap/pass collections should be transported to and released above each respective dam.

***Level of Effort/Cost, and Why Alternative Studies Will Not Suffice***
The level of cost and effort for the survey component of the study would be low; a minimal number of personnel may be able to conduct the weekly surveys. The trap/pass component would require low to moderate cost and effort. We estimate the cost will be approximately $50,000 for the study. No alternatives are proposed.

**REFERENCES**
ASMFC. 2014. Addendum IV to the Interstate Fishery management Plan for American Eel.
Machut, L.S., Limburg, K.E., Schmidt, R.E., and Dittman, D. 2007. Anthropogenic impacts on American eel demographics in Hudson River tributaries, New York. Transactions of the American Fisheries Society 136: 1699-1713.
Solomon, D.J., and Beach, M.H. 2004. Manual for provision of upstream migration facilities for Eels aned Elver. Environment Agency, Bristol, UK.

# Study Request #3
# Downstream American Eel Passage Assessment

***Goals and Objectives***

The goal of this study is to determine the impact of the East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, and the Ripogenus hydroelectric projects on the outmigration of silver eels in the West Branch of the Penobscot River. Project operations can result in delay, mortality or injury during emigration. It is important to understand the passage routes at the project and the potential for delay, injury, and mortality to determine measures and recommendations to increase survival and improve fish passage at the projects.

The objectives of this study are:

1. Quantify the movement rates, including delays, and relative proportion of eels passing via various routes at the project (i.e., through the turbines, through the downstream bypass, via spill at the dams, etc.).
2. Quantify the relative proportion of eels passing each potential emigration route (spill, bypass pipes, powerhouse) at the project during various project operations.
3. Evaluate instantaneous and latent mortality and injury of eels passed via each potential route.

***Resource Management Goals***

MDMR is a cabinet level agency of the State of Maine. MDMR was established to regulate, conserve, and develop marine, estuarine, and diadromous fish resources; to conduct and sponsor scientific research; to promote and develop marine coastal industries; to advise and cooperate with state, local, and federal officials concerning activities in coastal waters; and to implement, administer, and enforce the laws and regulations necessary for these purposes. MDMR is the lead state agency in the restoration and management of diadromous (anadromous and catadromous) species of fishes.

The Atlantic States Marine Fisheries Commission (ASMFC) has developed three documents related to the management of American eel and hydropower facilities:

1. Interstate Fishery Management Plan for American Eel. April 2000. Atlantic States Marine Fisheries Commission.
2. Addendum II to the Fishery Management Plan for American Eel. Atlantic States Marine Fisheries Commission. Approved October 23, 2008. 8 pp.
3. Addendum III to the Fishery Management Plan for American Eel. Atlantic States Marine Fisheries Commission. Approved August 2014. 19 pp.

Objectives of the management plan include: (1) protect and enhance American eel abundance in all watersheds where eel now occur; and (2) where practical, restore American eel to those waters where they had historical abundance, but may now be absent, by providing access to inland waters for glass eel, elvers, and yellow eel, and adequate escapement to the ocean for pre-spawning adult eel. Addendum II contains specific recommendations for improving upstream and downstream passage of American eel, including requesting that member states and jurisdictions seek special consideration for American eel in the Commission's relicensing process.

MDMR's management goal is to restore American eel to their historic habitat in the Penobscot River. The waters upstream of Projects represent significant habitat for American eel. The protection,

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enhancement, and restoration of this species relies on safe, timely, and effective downstream fish passage at the Projects.

***Public Interest***
The requester is a state natural resource agency.

***Existing Information and the Need for Additional Information***
The Pre-Application Document does not contain information on the route of passage or the amount of delay that occurs for emigrating adult eels. To date, no directed studies of eel entrainment or mortality have been conducted at the projects. These information gaps need to be filled so the natural resource agencies can assess the relative and cumulative impacts of project operations on outmigrating eels and develop adequate passage and protection measures to meet management goals and objectives.

***Nexus to Project Operations and Effects***
The East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, and the Ripogenus hydroelectric projects do not have entrainment prevention measures in place at their respective turbine intakes, nor are there designated spillway passage routes or fish bypass systems. To determine overall project survival, we need to understand the routes of emigration, the potential for delay under different river flow conditions and project operations, and the level of injury and/or mortality resulting from each potential passage route (i.e., the turbines, the spillway, etc). This study will contribute information in support of the licensing process, and development the administrative record in support of potential mitigation measures under Section 10(j) of the Federal Power Act.

***Methodology Consistent with Accepted Practice***
In order to understand the movements of outmigrating silver eels as they relate to operations at Ripogenus and Penobscot Mills, radio telemetry technology should be utilized. Radio- and PIT-tagging is an accepted technology which has been used for a number of studies associated with hydropower projects, including at projects in the mainstem Penobscot River and the Merrimack River.

Studies should be designed to investigate the size class among the full spectrum of silver eels at each project, route selection (i.e., entrainment vs. spill) independently from estimation of mortality/injury, because these metrics require different methodologies. Studies will also likely benefit from data collected over two study years to account for differences in environmental conditions and natural variation in eel migration (especially route selection studies, which may be more significantly affected by environmental conditions during a given season than mortality/injury studies). It is also envisioned that results from route selection studies can guide design of turbine mortality studies. Therefore, it is proposed, at a minimum, route selection studies be conducted in multiple years, but mortality/injury studies may be conducted after the first year of route selection studies have been completed.

**Objective 1: Route Selection**
This study will involve systematic releases of radio- and PIT-tagged silver phase eels at strategic points above areas of interest, to assess general routes of passage (i.e., via spill, bypass, or turbines). Active downstream migrants should be collected within-basin if possible, but fish sourced from out-of-basin may be acceptable to meet sample size demands. Experimental fish

must meet morphometric (e.g., eye diameter relative to body size) criteria to ensure they are migrant silver phase. Collections should be made within the migratory season, and eels should be tagged and released within 21 days after capture, but preferably within 7 days (particularly if the test eels are from out-of-basin).

All telemetered eels will be radio- and PIT-tagged. PIT antennas will be installed and monitored continuously to verify passage of eels via bypass channels.

A minimum number of 150 telemetered eels (e.g., five separate groups of approximately 30 eels each) per development will be required to maximize the data return. If enough eels cannot be captured for this study in a single year, the study will need to take place over the course of two years. Tagged eels should be released at an appropriate distance upstream of each dam. Groups of eels should be released during spill (if any) and non-spill and during periods of low, moderate, and high generation conditions. Since fish can drift a considerable distance downstream after they have died (Havn et al. 2017), a minimum of 25 dead eels should also be released as a control group in this study (at each project). Additionally, a control is needed to allow comparisons of movement rate and success of passed and non-passed eels in reaching the detection point downstream. Therefore, an additional 50 telemetered (uninjured) eels should be released below each project and tracked as they emigrate.

Telemetry receivers and antennas should be located upstream and downstream of the spillway, at turbine intakes, station tailraces, etc. These locations will permit assessment of passage via the following potential routes: spillway; station turbines; any existing upstream fishway attraction water intake, etc. The final placement of receivers and antennas should be developed in consultation with the Service and the other agencies.

Mobile tracking (i.e., via boat) in the river between release sites and tens of kilometers downstream will be performed at regular intervals during and after releases to confirm routes and fates of passed fish or lost fish.

Movement rates (time between release and detection at radio antenna locations, and between radio antenna locations) of eels passing the projects by various routes will also be quantified.

The route selection portion of this study should occur in both study years.

**Objective 2: Spill, Bypass, and Turbine Mortality/Injury Studies**
Spill, bypass, and turbine mortality will be assessed using a balloon-tag method.

For spill mortality sites (dam spillways and downstream bypasses), tagged eels will be injected or released into spill flow at points where water velocity exceeds 10 ft/sec to minimize the possibility of eels swimming upstream into the headpond or canal. Passed balloon-tagged eels will be recovered below areas of spill and held for 96 hours in isolated tanks for observation of injury and latent mortality; unrecovered balloon-tagged eels will be censored from the data. Passed eels should be x-rayed for any potential injuries per Muller et al. 2020.

For turbine mortality sites, tagged eels will be injected into intakes of all units associated with the projects, operating at a full range of settings where intake water velocity exceeds 10 ft/sec to minimize the possibility of eels swimming back upstream through the intakes. Passed balloon-

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tagged eels will be recovered in the tailrace(s) and held for 48 hours in isolated tanks for observation of injury and latent mortality; unrecovered balloon-tagged eels will be censored from the data.
If the balloon-tag mortality component of the study occurs in study year one, all possible route selection sites would need to be evaluated. If the balloon-tag mortality component of the study occurs in study year two, results from the route selection study could be used to inform which sites need to be evaluated for mortality. Eels recovered from balloon-tag studies should not be used for route selection studies.

Data analyses of route selection and mortality (instantaneous and latent) will follow standard methodology.

Project operation (flows, levels, gate openings, number of units operating and operation level) and environmental conditions (river flow, temperature, turbidity, air temperature, precipitation) will be monitored regularly (hourly measurements if possible) throughout the duration of the studies and assessed for potential relationships to passage route selection, migratory delay, and/or passage survival.

These methodologies are consistent with accepted practice.

***Level of Effort/Cost, and Why Alternative Studies Will Not Suffice***

The level of cost and effort for the downstream eel passage study will be moderate to high; silver eels would need to be collected, tagged, and released in several locations over the course of the migration season. Data would need to be retrieved periodically, then analyzed. A multi-site route selection study conducted by the USGS Conte Lab on the Shetucket River in Connecticut cost approximately $75,000 for the first year of study. Costs are estimated at $100,000 per year for the route selection study and $50,000 to $75,000 for the spill, bypass, canal, and turbine mortality/injury study. No alternatives are proposed.

**REFERENCES**

Havn, T. B., F. Økland, M.A. Teichert, L. Heermann, J. Borcherding, S.A. Sæther, O.H. Tambets and E.B. Thorstad. 2017. Movements of dead fish in rivers. Animal Biotelemetry, 5: 7.

Mueller M, K Sternecker, S Milz, J. Geist. 2020. Assessing turbine passage effects on internal fish injury and delayed mortality using X-ray imaging. PeerJ 8:e9977 DOI 10.7717/peerj.9977 17

## Study Request #4
## Downstream Passage Alternatives Study

***Goals and Objectives***

The first goal of this study is to determine conceptual options, and expected performances for, improved downstream passage that will reduce delay, increase passage efficiency, and increase survival for downstream migrating adult and juvenile Atlantic Salmon, juvenile Sea Lamprey, and adult eels as they attempt to pass the North Twin Development and Ripogenus dam. The second goal of this study is to determine conceptual options, and expected performances for, improved downstream passage that will reduce delay, increase passage efficiency, and increase survival for downstream migrating adult and juvenile Atlantic Salmon, juvenile Sea Lamprey, adult eels, adult and juvenile alewife, and adult and juvenile blueback herring as they attempt to pass the East Millinocket Development, Dolby Development, Millinocket Development, and Millinocket Lake Storage Development.

***Resource Management Goals***

MDMR is a cabinet level agency of the State of Maine. MDMR was established to regulate, conserve, and develop marine, estuarine, and diadromous fish resources; to conduct and sponsor scientific research; to promote and develop marine coastal industries; to advise and cooperate with state, local, and federal officials concerning activities in coastal waters; and to implement, administer, and enforce the laws and regulations necessary for these purposes. MDMR is the lead state agency in the restoration and management of diadromous (anadromous and catadromous) species of fishes.

The Atlantic States Marine Fisheries Commission (ASMFC) has developed three documents related to the management of American eel and hydropower facilities:

1. Interstate Fishery Management Plan for American Eel. April 2000. Atlantic States Marine Fisheries Commission.
2. Addendum II to the Fishery Management Plan for American Eel. Atlantic States Marine Fisheries Commission. Approved October 23, 2008. 8 pp.
3. Addendum III to the Fishery Management Plan for American Eel. Atlantic States Marine Fisheries Commission. Approved August 2014. 19 pp.

Objectives of the management plan include: (1) protect and enhance American eel abundance in all watersheds where eel now occur; and (2) where practical, restore American eel to those waters where they had historical abundance, but may now be absent, by providing access to inland waters for glass eel, elvers, and yellow eel, and adequate escapement to the ocean for pre-spawning adult eel. Addendum II contains specific recommendations for improving upstream and downstream passage of American eel, including requesting that member states and jurisdictions seek special consideration for American eel in the Commission's relicensing process.

The Atlantic States Marine Fisheries Commission (ASMFC) has also developed four documents related to the management of Shad and River Herring (Alewife and Blueback Herring) and hydropower facilities:

1. Interstate Fishery Management Plan for American Shad and River Herrings. October 1985. Atlantic States Marine Fisheries Commission.

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2. Amendment 1 to the Interstate Fishery Management Plan for American Shad and River Herring. April 1999. Atlantic States Marine Fisheries Commission.
3. Amendment 2 to the Interstate Fishery Management Plan for American Shad and River Herring. May 2009. Atlantic States Marine Fisheries Commission.
4. Amendment 1 to the Interstate Fishery Management Plan for American Shad and River Herring. February 2010. Atlantic States Marine Fisheries Commission.

The objectives of the management plan include:

1. Prevent overfishing of American shad stocks by constraining fishing mortality below F30.
2. Develop definitions of stock restoration, determine appropriate target mortality rates and specify rebuilding schedules for American shad populations within the management unit.
3. Maintain existing or more conservative regulations for hickory shad and river herring fisheries until new stock assessments suggest changes are necessary. This should keep fishing mortality sufficiently low to ensure survival and enhancement of depressed stocks and the maintenance of stabilized stocks.
4. Promote improvements in degraded or historic alosine habitat throughout the species= range. State and federal managers should consider the following methods to achieve this objective:
    a. Improve or install passage facilities at dams and other obstacles to provide upstream passage to historic spawning areas, or remove these obstacles entirely.
    b. Improve water quality in areas where water quality degradation may have affected alosine stocks. C. Evaluate current fish passage facilities for efficiency.
    c. Ensure that decisions on river flow allocation (e.g., irrigation, evaporative loss, out of basin water transport, hydroelectric operations) take into account flow needs for alosine migration, spawning, and nursery usage.
    d. Ensure that water withdrawal (e.g., cooling flow, drinking water) effects (e.g., impingement and entrainment mortalities, turbine mortalities) do not affect alosine stocks to the extent that they result in stock declines.
    e. Evaluate and improve downstream passage for adults and juveniles.
    f. Promote and coordinate alosine stocking programs for:
        i. reintroduction to historic spawning area
        ii. expansion of existing stock restoration programs
        iii. initiation of new strategies to enhance depressed stocks.
    g. Promote cooperative interstate research monitoring and law enforcement.

MDMR's management goal is to restore Atlantic Salmon, American shad, American Eel, Alewife, Blueback herring, and Sea Lamprey to their historic habitat in the Penobscot River. The waters upstream of Projects represent significant habitat for American eel. The protection, enhancement, and restoration of this species relies on safe, timely, and effective downstream fish passage at the Projects.

***Public Interest***

The requester is a state natural resource agency.

***Existing Information and the Need for Additional Information***

As indicated in the Pre-Application Document (PAD), eels occur upstream and downstream of the Ripogenus and Penobscot Mills projects. The American eel is a native migratory fish species of the Penobscot River watershed with a catadromous life cycle. Eels are widely recognized as a species of high ecological value and significance in its native habitats and has a significant commercial value in

certain markets. In addition, eels were important historically to the Penobscot Indian Nation and other tribes for spiritual sustenance as well as physical subsistence.

In addition, MDMR included comments that speak to the importance of historic habitat for Atlantic Salmon, American shad, Alewife, Blueback herring, and Sea Lamprey in the West Branch of the Penobscot River.

In the PAD GLHA states that downstream passage is not provided at the East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, or Ripogenus dam. Therefore, the current configuration at each facility is not designed to today's fish passage design criteria and is likely insufficient to adequately pass the relevant diadromous species as they attempt to migrate downstream past each project. An alternatives analysis of the existing configuration at each dam and the subsequent impact(s) on adult and juvenile Atlantic Salmon, juvenile Sea Lamprey, and adult eels is needed to evaluate each existing project as well as potential future project design and operation(s). An alternatives analysis of the existing configuration for the East Millinocket Development, Dolby Development, Millinocket Development, and Millinocket Lake Storage Development also needs to take into account adult and juvenile alewife, and adult and juvenile blueback herring.

***Nexus to Project Operations and Effects***

Hydropower project related mortality and delay has a direct effect on migratory fish populations. East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, and Ripogenus dam all lack guidance structures to keep fish out of project turbines. Therefore, eels in the West Branch are likely not realizing their full juvenile production and adult escapement potential. While upstream passage has precluded restoration of Atlantic Salmon, American shad, Alewife, Blueback herring, and Sea Lamprey, once upstream passage is established, effective downstream passage will be critical to the restoration of these species. Data derived from this study will facilitate evaluation of various fish passage alternatives, inform the Commission's licensing process, and contribute to the development of an administrative record in support of protection and enhancement opportunities related to Atlantic Salmon, American shad, American Eel, Alewife, Blueback herring, and Sea Lamprey.

***Methodology Consistent with Accepted Practice***

Fish Passage Engineering Alternative studies are a common way to explore various options in the decision-making process and have been used by the Commission in several licensing proceedings. This study will require a review of existing downstream fish passage technologies that meet FWS fish passage criteria (USFWS 2019 or the most recent version, as they become available) and should consist of conceptual engineering designs of downstream fish passage options that include physical screening of fish, adequate flows for attraction, and adequate relative velocities directing fish to downstream passage structures. Expected performance of each alternative should also be included in any report developed for this study.

The alternatives GLHA proposes to study for each project, the depth and breadth of the conceptual design, and the itemization and source of costs (as well as any potential lost generation modeling) should be agreed upon by the resource agencies prior to GLHA conducting the study.

***Level of Effort/Cost, and Why Alternative Studies Will Not Suffice***

The level of cost and effort for this study would be low to moderate; we estimate the cost will be approximately $30,000. No alternatives are proposed.

**REFERENCES**

USFWS (U.S. Fish and Wildlife Service). 2019. Fish Passage Engineering Design Criteria. USFWS, Northeast Region R5, Hadley, Massachusetts.

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# Study Request #5
# Upstream Passage Alternatives Study

***Goals and Objectives***

The first goal of this study is to determine conceptual options, and expected performances for, passage structures that will provide safe, timely, and effective upstream passage for upstream migrating adult Atlantic salmon and adult Sea Lamprey as they pass the North Twin Development and Ripogenus dam. The second goal of this study is determine conceptual options, and expected performances for, passage structures that will provide safe, timely, and effective upstream passage for upstream migrating adult Atlantic salmon, adult Sea Lamprey, adult alewife, and adult blueback herring as they attempt to pass the East Millinocket Development, Dolby Development, Millinocket Development, and Millinocket Lake Storage Development.

***Resource Management Goals***

MDMR is a cabinet level agency of the State of Maine. MDMR was established to regulate, conserve, and develop marine, estuarine, and diadromous fish resources; to conduct and sponsor scientific research; to promote and develop marine coastal industries; to advise and cooperate with state, local, and federal officials concerning activities in coastal waters; and to implement, administer, and enforce the laws and regulations necessary for these purposes. MDMR is the lead state agency in the restoration and management of diadromous (anadromous and catadromous) species of fishes.

The Atlantic States Marine Fisheries Commission (ASMFC) has developed three documents related to the management of American eel and hydropower facilities:

1. Interstate Fishery Management Plan for American Eel. April 2000. Atlantic States Marine Fisheries Commission.
2. Addendum II to the Fishery Management Plan for American Eel. Atlantic States Marine Fisheries Commission. Approved October 23, 2008. 8 pp.
3. Addendum III to the Fishery Management Plan for American Eel. Atlantic States Marine Fisheries Commission. Approved August 2014. 19 pp.

Objectives of the management plan include: (1) protect and enhance American eel abundance in all watersheds where eel now occur; and (2) where practical, restore American eel to those waters where they had historical abundance, but may now be absent, by providing access to inland waters for glass eel, elvers, and yellow eel, and adequate escapement to the ocean for pre-spawning adult eel. Addendum II contains specific recommendations for improving upstream and downstream passage of American eel, including requesting that member states and jurisdictions seek special consideration for American eel in the Commission's relicensing process.

The Atlantic States Marine Fisheries Commission (ASMFC) has also developed four documents related to the management of Shad and River Herring (Alewife and Blueback Herring) and hydropower facilities:

1. Interstate Fishery Management Plan for American Shad and River Herrings. October 1985. Atlantic States Marine Fisheries Commission.
2. Amendment 1 to the Interstate Fishery Management Plan for American Shad and River Herring. April 1999. Atlantic States Marine Fisheries Commission.

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3. Amendment 2 to the Interstate Fishery Management Plan for American Shad and River Herring. May 2009. Atlantic States Marine Fisheries Commission.
4. Amendment 1 to the Interstate Fishery Management Plan for American Shad and River Herring. February 2010. Atlantic States Marine Fisheries Commission.

The objectives of the management plan include:

1. Prevent overfishing of American shad stocks by constraining fishing mortality below F30.
2. Develop definitions of stock restoration, determine appropriate target mortality rates and specify rebuilding schedules for American shad populations within the management unit.
3. Maintain existing or more conservative regulations for hickory shad and river herring fisheries until new stock assessments suggest changes are necessary. This should keep fishing mortality sufficiently low to ensure survival and enhancement of depressed stocks and the maintenance of stabilized stocks.
4. Promote improvements in degraded or historic alosine habitat throughout the species= range. State and federal managers should consider the following methods to achieve this objective:
    a. Improve or install passage facilities at dams and other obstacles to provide upstream passage to historic spawning areas, or remove these obstacles entirely.
    b. Improve water quality in areas where water quality degradation may have affected alosine stocks. C. Evaluate current fish passage facilities for efficiency.
    c. Ensure that decisions on river flow allocation (e.g., irrigation, evaporative loss, out of basin water transport, hydroelectric operations) take into account flow needs for alosine migration, spawning, and nursery usage.
    d. Ensure that water withdrawal (e.g., cooling flow, drinking water) effects (e.g., impingement and entrainment mortalities, turbine mortalities) do not affect alosine stocks to the extent that they result in stock declines.
    e. Evaluate and improve downstream passage for adults and juveniles.
    f. Promote and coordinate alosine stocking programs for:
        i. reintroduction to historic spawning area
        ii. expansion of existing stock restoration programs
        iii. initiation of new strategies to enhance depressed stocks.
    g. Promote cooperative interstate research monitoring and law enforcement.

MDMR's management goal is to restore Atlantic Salmon, American shad, American Eel, Alewife, Blueback herring, and Sea Lamprey to their historic habitat in the Penobscot River. The waters upstream of Projects represent significant habitat for American eel. The protection, enhancement, and restoration of this species relies on safe, timely, and effective downstream fish passage at the Projects.

***Public Interest***

The requester is a state natural resource agency.

***Existing Information and the Need for Additional Information***

MDMR's comments in this filing speak to the importance of historic habitat for Atlantic Salmon, American shad, Alewife, Blueback herring, and Sea Lamprey in the West Branch of the Penobscot River.

In the PAD GLHA states that upstream passage is not provided at the East Millinocket Development, Dolby Development, Millinocket Development, Millinocket Lake Storage Development, or

Ripogenus dam. Therefore, the current configuration at each of these five facilities is not designed to today's fish passage design criteria and is likely insufficient to adequately pass the relevant diadromous species as they attempt to migrate downstream past each project. While the North Twin Development does have a fishway "for resident fish species", there is no known information on the effectiveness of the fishway. An alternatives analysis of the existing configuration at each dam and the subsequent impact(s) on adult Atlantic Salmon, and adult Sea Lamprey is needed to evaluate each existing project as well as potential future project design and operation(s). An alternatives analysis of the existing configuration for the East Millinocket Development, Dolby Development, Millinocket Development, and Millinocket Lake Storage Development also needs to take into account adult alewife, and adult blueback herring.

***Nexus to Project Operations and Effects***

Hydropower project related mortality and delay has a direct effect on migratory fish populations. East Millinocket Development, Dolby Development, Millinocket Development, Millinocket Lake Storage Development, and Ripogenus dam all lack upstream fish passage structures to allow fish access to upstream habitat. Lack of upstream passage extirpated Atlantic Salmon, American shad, Alewife, Blueback herring, and Sea Lamprey from historic habitat in the West Branch of the Penobscot River. Safe, timely, and effective upstream passage will be critical to the restoration of these species in the West Branch. Data derived from this study will facilitate evaluation of various fish passage alternatives, inform the Commission's licensing process, and contribute to the development of an administrative record in support of protection and enhancement opportunities related to Atlantic Salmon, American shad, Alewife, Blueback herring, and Sea Lamprey.

***Methodology Consistent with Accepted Practice***

Fish Passage Engineering Alternative studies are a common way to explore various options in the decision-making process and have been used by the Commission in several licensing proceedings. This study will require a review of existing downstream fish passage technologies that meet FWS fish passage criteria (USFWS 2019 or the most recent version, as they become available) and should consist of conceptual engineering designs of downstream fish passage options that include physical screening of fish, adequate flows for attraction, and adequate relative velocities directing fish to downstream passage structures. Expected performance of each alternative should also be included in any report developed for this study.

The alternatives GLHA proposes to study for each project, the depth and breadth of the conceptual design, and the itemization and source of costs (as well as any potential lost generation modeling) should be agreed upon by the resource agencies prior to GLHA conducting the study.

***Level of Effort/Cost, and Why Alternative Studies Will Not Suffice***

The level of cost and effort for this study would be moderate; we estimate the cost will be approximately $50,000. No alternatives are proposed.

**REFERENCES**

USFWS (U.S. Fish and Wildlife Service). 2019. Fish Passage Engineering Design Criteria. USFWS, Northeast Region R5, Hadley, Massachusetts.

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# Study Request #6
# Evaluation of the Size of American Eels and the Timing of their Downstream Migratory Movements

***Goals and Objectives***

The goal of this study is to understand the size range of eels moving past the projects as well as the migration timing of adult, silver-phase American eels in relationship to environmental factors and operations of hydropower projects on West Branch of the Penobscot River.

The objective of this study is to quantify and characterize (1) the full spectrum of silver eel sizes at each project; and (2) the general migratory timing and presence of adult, silver-phase American eels in the West Branch relative to environmental factors and operations of the East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, and Ripogenus hydroelectric projects.

***Resource Management Goals***

MDMR is a cabinet level agency of the State of Maine. MDMR was established to regulate, conserve, and develop marine, estuarine, and diadromous fish resources; to conduct and sponsor scientific research; to promote and develop marine coastal industries; to advise and cooperate with state, local, and federal officials concerning activities in coastal waters; and to implement, administer, and enforce the laws and regulations necessary for these purposes. MDMR is the lead state agency in the restoration and management of diadromous (anadromous and catadromous) species of fishes.

The Atlantic States Marine Fisheries Commission (ASMFC) has developed three documents related to the management of American eel and hydropower facilities:

1. Interstate Fishery Management Plan for American Eel. April 2000. Atlantic States Marine Fisheries Commission.
2. Addendum II to the Fishery Management Plan for American Eel. Atlantic States Marine Fisheries Commission. Approved October 23, 2008. 8 pp.
3. Addendum III to the Fishery Management Plan for American Eel. Atlantic States Marine Fisheries Commission. Approved August 2014. 19 pp.

Objectives of the management plan include: (1) protect and enhance American eel abundance in all watersheds where eel now occur; and (2) where practical, restore American eel to those waters where they had historical abundance, but may now be absent, by providing access to inland waters for glass eel, elvers, and yellow eel, and adequate escapement to the ocean for pre-spawning adult eel. Addendum II contains specific recommendations for improving upstream and downstream passage of American eel, including requesting that member states and jurisdictions seek special consideration for American eel in the Commission's relicensing process.

MDMR's management goal is to restore Atlantic Salmon, American shad, American Eel, Alewife, Blueback herring, and Sea Lamprey to their historic habitat in the Penobscot River. The waters upstream of Projects represent significant habitat for American eel. The protection, enhancement, and restoration of this species relies on safe, timely, and effective downstream fish passage at the Projects.

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***Public Interest***
The requester is a state natural resource agency.

***Existing Information and the Need for Additional Information***
The Pre-Application Document does not contain any information about (1) the size range of American eels in the West Branch of the Penobscot River; or (2) timing of downstream migratory movements and rates of eels in the West Branch. This information gap needs to be filled, as it relates directly to (1) more fully understanding survival estimates which will be provided via the requested *Downstream American Eel Passage Assessment*; and (2) when downstream passage and protection measures need to be operated.

***Nexus to Project Operations and Effects***
The timing of downstream migration of adult eels is not defined for the West Branch of the Penobscot River and there is no information about the size of the eels attempting to move downstream past the six projects that comprise Ripogenus and Penobscot Mills. Therefore, the general effects of hydroelectric project operations on eel survival to the ocean are unknown. Although separate study requests have been submitted to address project-specific downstream passage route selection, delays, and mortality of eels, general characteristics (size) of eels moving downstream and of river flow and environmental conditions may have significant relationships with project operation and eel migratory success and survival. For example, eels may tend to move immediately before or during periods of significant precipitation (or consequently river flow), times at which projects may be generating at maximum capacity or spilling, which may, or may not, present a higher passage risk to eels. Conversely, periods of low flow may be associated with a significant proportion of total river flow passing through turbine units, which present additional, or different, passage risk to eels. If discrete conditions which promote eel downstream migration are known, it may be possible to take actions with respect to project operations which reduce or minimize passage risk (i.e., operation of a bypass, reduction of intake approach velocities, directed spillage through a particular route at a project, etc). These studies should provide baseline information on river-specific downstream migration to predict when silver-phase eels are expected to migrate downstream in the West Branch, from which project operations could be modified to minimize passage risks.

***Methodology Consistent with Accepted Practice***
Quantification of downstream movements of American eels in river systems requires systematic sampling of migrants throughout the migratory season. This can be accomplished with traditional active trapping methods (i.e., fyke or stow net sampling, weirs, or eel racks). Passive monitoring of migrant eels using hydroacoustic methods offers an alternative to active trapping. However, this form of passive monitoring requires verification of potential acoustic targets with some level of active (collection) or visual (traditional optical or acoustic video) sampling.

The Applicant will need to identify at least two potential locations that offer opportunities to conduct simultaneous passive and active sampling. Each location will need to possess a route of downstream passage which conducts a significant proportion of river flow and each would need a proximal bypass equipped with a sampler so that fish can be concentrated/collected from the passage route and identified to species. Project operations will influence the relative proportion of flow (and thus numbers of downstream migrant eels) in each passage route, so numbers of eels sampled in each route represent only a proportion of the total number of eels migrating downstream within the entire river. Since the absolute proportion of eels using a specific route at any one time is unknown,

numbers of eels quantified within a route must serve as a relative index of the degree of migratory movement.

This study should quantify eel movements for two consecutive years since environmental conditions strongly influence migratory timing of eels, which can vary significantly from year to year (Haro 2003). Eels should also be measured during both study seasons, throughout the downstream passage season.

Eels should be quantified using methods similar to Haro et al. (1999), by continuously monitoring a fixed location at the projects with hydroacoustics. Since eels tend to concentrate in areas of dominant flow (Brown et al. 2009; EPRl 2001), the zone to be monitored should pass a dominant proportion of project flow throughout most periods of operation (i.e., forebay intake areas). Hydroacoustic monitoring shall encompass the entire potential migratory season, beginning in mid-August and ending in mid-December, and shall operate 24 hours per day. Data will be recorded for later processing and archiving.

Systematic active quantification of eels at downstream bypass samplers shall be performed simultaneously with passive hydroacoustic monitoring, to verify presence of eels and relative abundance of eel-sized hydroacoustic targets from the hydroacoustic data as well as the sizes of the eels collected.[1] Although daily operation of the bypass sampler could be performed, a more comprehensive technique is to monitor eels entering the bypass with an acoustic camera (i.e., DIDSON, BlueView, etc.). The acoustic camera will afford positive visual identification of eels as they enter the bypass, which is a concentration point for migrating eels. Acoustic camera monitoring will also allow monitoring to be performed 24 hours a day, and will be relatively unaffected by water turbidity (which influences effectiveness of traditional optical video monitoring). The acoustic camera system will be operated during the same time period as acoustic monitoring, and images will be recorded for later processing and archiving.

Data analyses of size of eels, hydroacoustic, acoustic camera, bypass sampling, and environmental/ operational data will follow standard methodology.

Each project's operations (flows, levels, gate openings, number of units operating and operation level) and environmental conditions (river flow, temperature, turbidity, air temperature, precipitation) will be monitored regularly (hourly measurements if possible) throughout the duration of the studies.

***Level of Effort/Cost, and Why Alternative Studies Will Not Suffice***

The level of cost and effort for the downstream migrant eel migratory timing study would be moderate, given the level of cost for instrumentation, deployment, and data review/analysis. Cost is estimated at $50,000 per year for the study. No alternatives are proposed.

**REFERENCES**

Brown, L., A. Haro, and T. Castro-Santos. 2009. Three-dimensional movement of silver-phase American eels in the forebay of a small hydroelectric facility. Pages 277-291in: J. Casselman et al. editors. Eels at the Edge: Science, Status, and Conservation Concerns. American Fisheries Society, Bethesda, MD.

[1] If all eels are not sampled, and a subset are measured for morphometrics, a power analysis will need to be performed that determines the most suitable sample size for this effort. 23

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OFFICES AT 32 BLOSSOM LANE, MARQUARDT BUILDING, AUGUSTA, MAINE
http://www.Maine.gov/dmr
PHONE: (207) 624-6550 FAX: (207) 624-6024

October 8, 2021

Kimberly Bose, Secretary
Federal Energy Regulatory Division
888 First Street, N .E.
Washington, D.C. 20426

**RE: Comments and Study Requests on Great Lakes Hydro America, LLC (GLHA) Notice of Intent to File License Application and Filing of Pre-Application Document for the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458)**

Dear Secretary Bose:

On June 11, 2021, you issued a Notice of Intent to File License Application, Filing of Pre-Application Document (PAD), Commencement of Pre-Filing process, and Scoping; Request for Comments on the PAD and Scoping Document, and Identification of Issues and Associated Study Requests for Great Lakes Hydro America, LLC's (GLHA) Ripogenus Project (FERC No. 2572) and Penobscot Mills Project (FERC No. 2458). The PAD contains the Licensee's presentation of information about the projects themselves and the environmental resources the Licensee states are affected by the projects.

As described in the scoping document, the Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot Counties, Maine. The Ripogenus Project is located about 47 river miles upstream of the confluence of the East Branch Penobscot River creating the 20.8 mile long, 29,270 acre impoundment that constitutes Ripogenus, Caribou, and Chesuncook Lakes and Black, Brandy, and Moose Ponds.

The Penobscot Mills Project consists of five dams; four hydropower developments (North Twin, Millinocket, Dolby, and East Millinocket) located between river miles 2 and 15 on the West Branch, and one storage development located on Millinocket Stream. The North Twin impoundment is at the upstream end of the Penobscot Mills Project. Controlled releases from the North Twin dam pass through three other dams and associated generation facilities of the Penobscot Mills Project, including the Millinocket, Dolby, and East Millinocket dams. The Millinocket Lake Storage Dam includes a pumping station where water can be pumped to Ambajejus Lake (within the North Twin impoundment) or discharged to Millinocket Stream via the Millinocket Lake Dam. Based on the descriptions in the PAD, it is our understanding that over the term of the current license, project operations have shifted from seasonal store and release to pulsing or peaking operations; pulsing and peaking operations result in significant changes to the environment compared to seasonal store and release.

Dams in the West Branch were directly responsible for the extirpation of diadromous fish, including Atlantic salmon (now endangered), that once flourished in the West Branch, as well as the destruction of their habitats (*see* Schmitt, 2015). Today, the Penobscot Mills Dams and the Ripogenus Dam are part of a network of dams in the West Branch that are directly responsible

for preventing sea-run fish from accessing the river, which prevents the restoration of these resources and their habitats. Furthermore, the reregulation of flows on the West Branch Penobscot at the Ripogenus and Penobscot Mills dams that are purportedly designed to dampen the variability and occasional extreme seasonal precipitation (GLHA 2021) affect Atlantic salmon designated critical habitats in the mainstem Penobscot and may impact survival of Atlantic salmon and other diadromous fish. The West Branch once provided high gradient, climate resilient, ecologically unique habitats in the Penobscot watershed that Atlantic salmon once thrived in, but these habitats are now inaccessible because of dams. Ecologically and economically important alosines used to inhabit the lower West Branch up to Shad Pond, while American eel and sea lamprey historically inhabited the majority of the West Branch. These species have been extirpated from the West Branch due to the construction and continued existence of dams without effective fishways. We highlight these impacts to form the basis of our comments and the studies that we are requesting.

We understand that the Commission will make a determination regarding the necessity of an Environmental Impact Statement (EIS) or Environmental Assessment (EA) pursuant to the National Environmental Policy Act (NEPA) after GLHA files its final license application. However, given the existing information on project effects to NMFS trust resources, FERC should analyze the impacts of the project through an EIS, rather than an EA, due to the complex nature of the project and its impacts. Comments on the PAD from many stakeholders, including expert testimony from Ed Spear, have made compelling arguments that these dams and their operations likely result in considerable negative ecological impacts to the West Branch Penobscot River. New flow and impoundment management regimes since the last relicensing can affect flows and water temperatures in the mainstem Penobscot that emanate into ecological impacts that may affect the endangered Gulf of Maine distinct population segment of Atlantic salmon and its designated critical habitat. This relicensing is also expected to generate significant public interest. For these reasons, there is sufficient information indicating that these projects affect important natural resources, and their relicensing constitutes a major federal action significantly affecting the quality of the human environment. Pursuant to your responsibilities under NEPA, FERC should conduct a full alternatives analysis that includes consideration of an alternative that would result in the decommissioning and removal of the Ripogenus and Penobscot Mills dams.

The Penobscot River including the West Branch, and the lands around it, are the homelands of the Penobscot Indian Nation (PIN). The PIN has depended on the river and the surrounding land for its natural resources and for transportation for thousands of years. The Penobscot name for the West Branch *Ketteteqwewick*, means “the main branch.” It was given this name because it was the canoe route to Mount Katahdin, which is the Tribe’s most sacred place (*www.penobscotnation.org*).

PIN is an important partner to the U.S. Fish and Wildlife Service and NMFS in efforts to restore and recover migratory fish species, including endangered Atlantic salmon, to the Penobscot River and its tributaries. We recognize the unique and distinctive relationship that exists between the United States and each Indian tribe including PIN, and strongly encourage FERC to work with the PIN to understand and fully consider their positions and interests regarding the potential continued operation of these projects.

We have reviewed the PAD and attended the scoping meeting on September 9, 2021. Our attached comments on the PAD and study requests emanate from our agency's authorities to protect, manage, and conserve the nation's living marine resources and associated habitats. The studies that we have identified are necessary to inform how these projects affect NOAA trust resources, including endangered Atlantic salmon in the mainstem Penobscot River and their critical habitat so that adverse impacts can be appropriately avoided or mitigated through license articles.

Specific studies that we are requesting are:

- Evaluate how the operations of the Penobscot Mills and Ripogenus Dam affects the hydrology of the West Branch and mainstem Penobscot River using an Indicators of Hydrologic Alteration Model
- Evaluate project effects on river temperature in the West Branch and mainstem Penobscot River
- A study to evaluate future flow and water temperature scenarios

If you have any questions or need additional information regarding our comments or study requests, please contact Dan Kircheis at dan.kircheis@noaa.gov.

Sincerely,

Jennifer Anderson

Jennifer Anderson
Assistant Regional Administrator
for Protected Resources

cc: Service List

**National Marine Fisheries Service's Comments and Study Requests on Brookfield Renewable's Pre-Application Document for the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458)**

1. Project Background

The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot Counties, Maine. The Ripogenus Project is located about 47 river miles upstream of the confluence of the East Branch Penobscot River creating the 20.8 mile long, 29,270 acre impoundment that constitute Ripogenus, Caribou, and Chesuncook Lakes and Black, Brandy, and Moose Ponds.

The Penobscot Mills Project consists of five dams. Four hydropower developments (North Twin, Millinocket, Dolby, and East Millinocket are located between river miles 2 and 15 on the West Branch and one storage development is located on Millinocket Stream. The North Twin Impoundment is at the upstream end of the Penobscot Mills Project and receives flow from the Ripogenus Project. Controlled releases from the North Twin Development pass through three other developments and associated generation facilities of the Penobscot Mills Project, including the Millinocket, Dolby, and East Millinocket Developments. The Millinocket Lake Storage Development includes a pumping station where water can be pumped to Ambajejus Lake (within the North Twin impoundment) or discharged to Millinocket Stream via the Millinocket Lake Dam.

2. Federal Statutory Requirements

We are responsible for conservation, management, and protection of living marine and aquatic resources throughout jurisdictional river basins in coordination with other state and federal agencies, local governments, Indian tribes, fisheries commissions, and conservation organizations. Our authority to manage diadromous fish in these river basins comes from Congress. Specifically, Congress has directed us to manage diadromous species, including a grant of discretionary authority to us, to order fish passage at dams licensed by the Federal Energy Regulatory Commission. NMFS' congressionally mandated statutory authorities include the Federal Power Act, the Endangered Species Act, the Magnuson-Stevens Fishery Conservation and Management Act, the Atlantic Coastal Fisheries Cooperative Management Act, the Fish and Wildlife Coordination Act, and the National Environmental Policy Act.

*A. The Federal Power Act (FPA) (as amended)(16 USC §§791a, et seq.)*

Section 18 of the FPA expressly grants to the Department of Commerce (DOC) and the Department of the Interior authority to prescribe fishways. Section 18 of the FPA states that FERC must require construction, maintenance, and operation by a licensee at the licensee's own expense of such fishways, as may be prescribed by the Secretary of Commerce or the Secretary of the Interior. Within the DOC, the authority to prescribe fishways is delegated to the NMFS Regional Administrators.

Under Section 10(j) of the FPA, licenses for hydroelectric projects must include conditions to protect, mitigate damages to, and enhance fish and wildlife resources, including related spawning

grounds and habitat. These conditions are to be based on recommendations received from federal and state fish and wildlife agencies. FERC is required to include such recommendations unless it finds that they are inconsistent with Part I of the FPA or other applicable law, and that alternative conditions must adequately address fish and wildlife issues. Before rejecting an agency recommendation, FERC must attempt to resolve the inconsistency, giving due weight to the agency's recommendations, expertise, and statutory authority. If FERC does not adopt a Section 10(j) recommendation, in whole or in part, it must publish findings that adoption of the recommendation is inconsistent with the purposes and requirements of Part 1 of the FPA or other applicable provisions of law, and that conditions selected by FERC adequately and equitably protect, mitigate damages to, and enhance fish and wildlife and their habitats.

Resource agencies and tribes may also recommend conditions under Section 10(a)(1) of the FPA for the protection, mitigation, and enhancement of fish and wildlife (including related spawning grounds and habitat) consistent with a comprehensive plan.

### *B. Endangered Species Act (ESA) of 1973 (as amended) (16 USC §§1531, et seq.)*

The purpose of the ESA is to protect and recover imperiled species and the ecosystems upon which they depend. It is administered by the Department of Interior's U.S. Fish and Wildlife Service (USFWS) and the Commerce Department's NMFS. The USFWS has primary responsibility for terrestrial and freshwater organisms, while the responsibilities of NMFS are mainly marine wildlife, such as whales, and anadromous fish, such as salmon.

Under the ESA, species may be listed as either endangered or threatened. "Endangered" means a species is in danger of extinction throughout all or a significant portion of its range. "Threatened" means a species is likely to become endangered within the foreseeable future. All species of plants and animals, except pest insects, are eligible for listing as endangered or threatened. For the purposes of the ESA, Congress defined species to include subspecies, varieties, and, for vertebrates, distinct population segments.

Section 7(a)(1) of the ESA requires federal agencies to use their authorities to further the conservation of listed species. ESA section 7(a)(2) states that each federal agency shall, in consultation with the Secretary of Commerce or Interior, as appropriate, insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. Any discretionary federal action that may affect a listed species or its critical habitat must undergo ESA section 7 consultation. Issuance of a hydroelectric project license by the Commission is an action that may require ESA section 7 consultation.

### *C. Magnuson-Stevens Fishery Conservation and Management Act (MSA) (as amended) (MSA) (16 USC §§1801, et seq)*

The 1996 amendments to the MSA set forth a number of mandates for us, the Fishery Management Councils (Councils), and other federal agencies to identify and protect important marine and diadromous fish habitats. The Councils are required to identify and describe essential fish habitat (EFH) for all managed species in order to protect habitat from fishing impacts and to allow for consultation with federal agencies whose actions may adversely impact

EFH, which is defined as "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity." 16 U.S.C. § 1853(a)(7) and § 1802(10). The MSA requires federal agencies to consult with the Secretary of Commerce, through us, with respect to "any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any essential fish habitat identified under this Act." 16 U.S.C. § 1855(b)(2). In the EFH consultation process, the federal action agency initiates consultation by preparing and submitting a completed EFH assessment describing the potential impacts of the action on EFH.

*D. The Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA) (as amended) (16 USC §§5101, et seq.)*

The purpose of the ACFCMA is to provide for more effective fishery resource conservation of coastal fish species that are distributed across the jurisdictional boundaries of the Atlantic States and the Federal Government. These coastal fish species, which include American Eel, shad and river herring, are managed by various species boards of the Atlantic States Marine Fisheries Commission, which develop fishery management plans and recommend management action to the states and NMFS.

*E. The Fish and Wildlife Coordination Act (FWCA) (as amended)* (16 USC §§661, *et seq*.)

The FWCA provides that fish and wildlife conservation shall receive equal consideration and be coordinated with other features of water resource development programs. A Federal action agency, such as the Federal Energy Regulatory Commission (FERC), shall consult with us with a view to the conservation of fish and wildlife resources by preventing loss of and damage to such resources as well as providing for the development and improvement thereof in connection with such water resource development. We may provide recommendations to the Federal action agency to which the action agency shall give full consideration.

*F. The National Environmental Policy Act (NEPA) (as amended)* (42 USC §§4321, *et seq*.)

NEPA and its implementing regulations require federal action agencies to analyze the direct and indirect environmental effects and cumulative impacts of project alternatives and connected actions. NEPA requires the federal action agency to conduct a comparative evaluation of the environmental benefits, costs, and risks of the proposed action, and alternatives to the proposed action.

3. NOAA Trust Resources

NOAA's NMFS is a trustee for coastal and living marine resources, including commercial and recreational fisheries, diadromous species, marine mammals, and marine, estuarine, and coastal habitat systems. Through management, conservation and recovery efforts, and public outreach and education under the Marine Mammal Protection Act and Endangered Species Act (ESA), we strive to ensure the survival of the protected marine species in the Northeast United States for

future generations. These projects occur within the historical range of federally listed Gulf of Maine (GOM) Distinct Population Segment (DPS) of Atlantic salmon; however, because of the construction of dams without fish passage, no fish species protected under the ESA occur in the West Branch Penobscot River above the Medway Dam, nor has any critical habitat been designated under the ESA. That said, before the construction of dams, the West Branch Penobscot supported ecologically, culturally, and commercially significant populations of sea-run fish, including Atlantic salmon, American shad, American eel, alewife and blueback herring (Houston et al. 2007). It is assumed the West Branch also supported sea lampreys (Houston et al. 2007) that provide a number of ecologically important functions.

Our work is guided by two core mandates – to ensure the productivity and sustainability of fisheries and fishing communities through science-based decision-making and compliance with regulations, and to recover and conserve protected resources through the use of sound natural and social sciences and compliance with regulations.

4. Protected Species and Designated Critical Habitat in the Project Area

The GOM DPS of Atlantic salmon is listed as endangered under the ESA (65 FR 69459 and 74 FR 29344). The GOM DPS includes all anadromous Atlantic salmon whose freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River. Included are all associated conservation hatchery populations used to supplement these natural populations. Atlantic salmon are jointly listed by NMFS and USFWS. Pursuant to a March, 2009 Statement of Cooperation between NMFS and USFWS concerning implementation of the ESA for endangered Atlantic salmon, NMFS has the lead for all section 7 consultations considering the effects of dams on the GOM DPS of Atlantic salmon and their designated critical habitat. The overarching goals of NMFS and USFWS with respect to endangered Atlantic salmon are to recover the species and *conserve* the ecosystem on which they depend. Accordingly, for these projects, we must ensure that any activities that may affect Atlantic salmon and its designated critical habitat are avoided or minimized to the extent practicable in order to *conserve* the ecosystems that salmon depend upon. As described above, the purposes of the ESA are "*to provide a means whereby the ecosystems upon which endangered and threatened species depend may be conserved, and to provide a program for the conservation of such endangered species and threatened species*" (ESA Sec. 2(b)). The ESA defines the terms "conserve," "conserving," and "conservation" to mean "*the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary*" (ESA Sec. 3(3)).

The West Branch Penobscot is within the historic range of the GOM DPS of Atlantic salmon. It is a sub-basin of the Penobscot River basin that accounts for approximately 25 percent of the entire Penobscot basin drainage area, and once provided substantial, ecologically important habitat that supported robust runs of Atlantic salmon (Fay et al. 2006). Historically, Atlantic salmon ranged throughout the West Branch as far as Penobscot Brook, a distance over 350 river km inland (Atkins, 1868). Today, the distribution of Atlantic salmon is limited by dams. Anadromous Atlantic salmon were extirpated in the West Branch in the late 1800s to early 1900s. While Atlantic salmon continue to persist in the mainstem Penobscot River, the Medway Dam in the lower West Branch (which has no upstream fish passage facilities) blocks further

passage into the West Branch. Even if Atlantic salmon could move up past the Medway Dam, the Penobscot Mills Project dams, that also have no fish passage, block further access into the watershed and prevent access to spawning and rearing habitat.

Absent dams, the West Branch would contain abundant, high quality Atlantic salmon habitat. The West Branch was not designated as critical habitat because it was not occupied by the species at the time of listing (i.e., because dams prevented access to the West Branch and had resulted in the loss of any anadromous Atlantic salmon in the river), and we determined that the habitat in the West Branch was not essential to achieving the recovery goals of the species (74 FR 29300, June 2009) because of abundant habitat elsewhere in the Penobscot watershed. It is important to note that this does not mean that if restoration of Atlantic salmon could be achieved in the West Branch that this would not be meaningful for the recovery of Atlantic salmon; we expect that such restoration would in fact contribute to achieving recovery goals and could help accelerate the recovery timeline and improve the resilience of the DPS. However, restoration of Atlantic salmon in the West Branch is not as simple as merely providing fish passage at these projects. In order to reach suitable habitat in the upper reaches of the West Branch, upstream fishways would need to be constructed at five dams on the river. It is likely that even if state-of-the-art fishways were installed, the cumulative effect of direct and delayed mortality that both smolts and adults would experience passing through a minimum of eight dams (five West Branch dams and three mainstem dams) would come at a far greater cost to the population than if these fish are excluded from entering the West Branch in hopes that they continue to seek out high valued, unobstructed habitats in the East Branch of the Penobscot River (*See* Stich et al. 2015). In our view, the removal of multiple dams and the restoration of anadromous Atlantic salmon in the West Branch would provide a clear conservation benefit to the GOM DPS as a whole, and should be fully considered in the NEPA process.

Finally, these dams and associated impoundments and the operations of these dams significantly alter the natural flow regime of the West Branch Penobscot. Given the size of the West Branch, the size of the impoundments created by these dams, and the substantial flow modifications associated with the Ripogenus and Penobscot Mills Projects (GLHA 2021), one can reasonably assume that the effects of these projects and their operations extend into the mainstem Penobscot. Altering natural flow regimes, including the timing, frequency, or duration of natural flow events can reduce habitat diversity, disrupt migration and spawning cues for fish, and alter the survival and distribution of juvenile fish and macroinvertebrates (Meridian 2004). Furthermore, changes in streamflow, including dam impoundments and flow management through dams, significantly affect water temperatures due to changes in thermal capacity (Webb et al. 2003). Water temperature is especially important for Atlantic salmon given that they are poikilothermic (i.e. their body temperatures and metabolic processes are determined by temperature). Temperature is a stimulant for salmon migration, spawning, and feeding (Elson 1969). Temperature also significantly influence egg incubation success or failure, food requirements and digestive rates, growth and development rates, vulnerability to disease and predation, and may be responsible for direct mortality (Garside 1973; Spence et al. 1996; Peterson et al. 1977, Whalen et al. 1999).

Given the nature of these impacts, the flow alterations attributed to the Penobscot Mills and Ripogenus projects likely affect designated Atlantic salmon critical habitat and may affect Atlantic salmon survival and recovery.

5. NOAA Comments on the PAD

**Comment 1.** Penobscot Scoping Document Section 3.4.3 - Project Decommissioning

In section 3.4.3 of the scoping document, FERC states that it is not considering decommissioning as an alternative to these projects as they have no record that demonstrates serious resource concerns that cannot be mitigated if the projects are relicensed. The Commission is fully aware that the construction of the Penobscot Mills and Ripogenus Projects extirpated runs of anadromous species in the West Branch of the Penobscot River. We are also confident that the Commission is fully aware *at this time* that relicensing the projects will result in the continued extirpation of these species in the river absent bold actions such as dam decommissioning and removal. These projects represent a significant natural resource concern that should be fully evaluated within the NEPA process, including an alternatives analysis that considers the decommissioning and removal of the Ripogenus and Penobscot Mills dams. The information that would come from such an alternatives analysis is necessary to provide state and federal agencies and the public the information they need to fully understand the economic, environmental, and social opportunities/costs of the West Branch both with and without the dams associated with these projects. The Recovery Plan for the GOM DPS of Atlantic salmon (2019) lists dam removals as one of the threats-based criteria necessary to eliminate the threat of extinction and support a recovered GOM DPS of Atlantic salmon. Dam removal is also a specific recovery action for increasing the carrying capacity for Atlantic salmon to support a growing and self-sustaining population. Furthermore, we note that project decommissioning with dam removal is the only alternative that could *adequately* mitigate the threat to sea-run fish posed by these Projects as there are no plausible engineering solutions available today that could allow for both continued existence of the projects and restoration of sea-run fishes in the West Branch. As such, we recommend the Commission include project decommissioning with removal as a reasonable alternative to be considered in its NEPA analysis.

The dams associated with these projects are part of a network of dams in the West Branch that were directly responsible for the extirpation of diadromous fish, including Atlantic salmon (now endangered), that once lived in the West Branch, as well as the destruction of their habitats (*See* Schmitt, 2015). Today, these dams are directly responsible for preventing sea-run fish from accessing the river, preventing the restoration of these resources and their habitats. Action C2.4 of the *Final Recovery Plan for Atlantic Salmon* (USFWS & NMFS 2019) states that when feasible, hydro-electric dams that block habitats that afford significant conservation benefits to Atlantic salmon and their ecosystems should be removed. Although the West Branch is not part of Atlantic salmon's designated critical habitat and was determined in 2012 (74 FR 29300) to not be essential to the conservation of the species, it does contain significant habitats that, if the dams were removed, it could contribute significantly to the conservation of the species. At present, we are not aware of any engineered fish passage solutions that could be implemented at the Penobscot Mills and Ripogenus project dams that would allow for sufficient survival of Atlantic salmon such that passage into the West Branch would provide a conservation benefit to the species. This is a consequence of the number of dams associated with Penobscot Mills and Ripogenus projects in combination with the dams on the mainstem Penobscot that Atlantic salmon would have to pass through in order to access spawning and nursery habitats. The same impacts may be true for other sea-run fish as well, particularly American shad, where the cumulative impacts of dams severely impact survival and spawning success. The extirpation of

sea-run fish by these dams, the exclusion of sea-run fish caused by the dams under these licenses, and the fact that there are no plausible engineered fish passage solution that would afford a conservation benefit to Atlantic salmon, represent serious natural resource concerns that may not be able to be appropriately mitigated if the projects are relicensed.

Given that dam removal has never been considered or evaluated for these projects, we contend that FERC has responsibilities under NEPA to evaluate decommissioning and dam removal as an alternative during this relicensing. This is necessary to strike an appropriate balance among the many competing developmental and non-developmental interests (including conservation interests) in the West Branch. This evaluation will provide the public and resource agencies the necessary information to fully evaluate the effects of these dams on public resources.

**Comment 2:** Scoping Document Section 5.0 - Description of Existing Environment and Resource Impacts

In the June, 2021 PAD, GLHA claims that "A significant body of information presently exists relative to the Ripogenus and Penobscot Mills Projects; even so, GLHA understands that some level of additional study or information gathering may be necessary in support of the application for new licenses." We agree with GLHA that additional study and information gathering is necessary, but attribute little value to the existing information which is more than thirty years old. Additional fisheries data must be collected as part of this relicensing to adequately describe the projects' effects on existing fisheries resources in the project areas and downstream of the projects. Despite the fact that nearly all of the information concerning existing environmental resources presented in the PAD was collected over thirty years ago during the last relicensing, GLHA does not propose a single fisheries related study as part of this relicensing. As an example of the limitations of relying on non-contemporary data to describe existing fisheries resources, Table 5.4-3 in the PAD indicates that smallmouth bass do not occur in North Twin Lake or Quakish Lake. This is not accurate. Smallmouth bass are known to presently inhabit each of these water bodies (personal communication, Kevin Dunham, MDIFW, September 30, 2021). The MDIFW first documented smallmouth bass in North Twin Lake in 2005 (personal communication, Kevin Dunham, MDIFW, September 30, 2021). The fisheries resources of the West Branch of the Penobscot River have changed dramatically over the last 30 years including the colonization of smallmouth bass into the Pemadumcook chain of lakes, and the decline of American eel throughout most of their range (Shepard 2015). These impacts to the fisheries resources in the project areas are undoubtedly exacerbated by these dams, their operations, and the associated impoundments. It is incumbent on FERC and GLHA to collect the necessary data to accurately and thoroughly document the fisheries resources in the Penobscot Mills and Ripogenus Projects areas.

**Comment 3:** Scoping document 3.1.4 and PAD Table 6.1-2 and 3 (Environmental measures for aquatic resources and Potential Project Effects)

The Table of Potential Project Effects (Table 6.1-2 and 3) does not describe project impacts to sea-run fish in the mainstem of the Penobscot, including endangered Atlantic salmon and their designated critical habitat. These impacts need to be fully characterized as the information will be necessary for the formulation of license articles. GLHA indicates in Vol. 1 of the PAD (Section 1.6) that the Project storage impoundments are "*managed on an annual cycle to dampen the variability and occasional extremes of seasonal precipitation and runoff through storage*

*within the impoundments. This storage allows for continuous flows to downstream aquatic habitat and spawning areas within the West Branch and the mainstem of the Penobscot River during times of lower inflows to the system. In addition, the storage allows flows from the West Branch to be reduced during higher seasonal flow periods when the combined flows from the East and West Branches have the potential to adversely impact human life, property, and environmental resources downstream along the mainstem Penobscot River."* As the effects of project operation are expected to extend into the mainstem, where several of our trust species occur, any analysis of project effects must include effects to species in the mainstem and associated habitats.

**Comment 4:** Scoping Document 3.1.3 Project Operation

There appears to be discrepancies regarding the descriptions of current operations of the Penobscot Mills and Ripogenus Projects. In the August 2021 Scoping Document 1, the Commission describes operation of the Ripogenus Project as "store-and-release facility with an annual seasonal drawdown that allows for management of water levels and flows downstream of the project." The Commission also describes the operation of North Twin and Millinocket Lake Storage as "store and release developments."

On p. 13 in the PAD for the Ripogenus and Penobscot Mills Project (Volume 1 of 2) GLHA states:

> *In addition to these considerations, the need for power, grid stability, and reliability are also important aspects GLHA will promote in these relicensing proceedings. Peak demands for power can vary greatly depending on the time of day and from season to season.* ***Hydropower facilities that have peaking ability*** *(emphasis added) or other operational flexibility provide not only a reliable source of renewable and carbon-free energy to the grid, but they are also needed and used to maintain the balance between electricity supply and demand. The flexibility and storage capacity of hydropower supports continued development of intermittent renewable energy sources, such as solar or wind, by providing quick responses to changes in output. The base-load energy and grid stability provided by hydropower is very different than, and wholly complimentary to, that provided by solar or wind energy.*
>
> *The electrical output from the Projects is sold to the New England wholesale electricity market administered by the Independent System Operator of New England (ISONE). The Projects generate carbon-free, renewable power and* ***provide peaking and variable output generation*** *(emphasis added) of value to the grid. Power from the Projects helps meet the Nation's and regional carbon reduction goals, reduces reliance on natural gas to meet sudden changes in demand, and facilitates adoption of other intermittent renewable energy sources.*

On p. 1-15 of the PAD, GLHA states:

> *If the existing flexibility, operational ranges, or* ***peaking capabilities*** *(emphasis added) of the Projects as presently licensed were further limited or curtailed, the ISONE would need to rely more heavily on natural gas burning facilities to meet peak power demands now and into the foreseeable future.*

During the Commission's agency and NGO scoping meeting on September 9, 2021, the Licensee stated that neither the Ripogenus nor Penobscot Mills operate as peaking facilities. We understand that a licensed peaking operation would permit a Licensee to shift generation to times of greater energy demand and thus higher operating revenues. The Commission should immediately review operations data for the Ripogenus and Penobscot Mills Project to determine the exact mode of operation for these projects, and if necessary, update Scoping Document 1 to accurately describe these operations.

The PAD suggests that there have been no changes in operations since the last relicensing and that therefore the licensee is not considering the collection of any additional fisheries data as part of this relicensing. However, as we have detailed above, there are several instances in the PAD where GLHA indicates that peaking is now a component of project operations of these dams, which is a change in operation since the last relicensing. Given that the PAD does not provide clear evidence to demonstrate that there actually have been no changes in the project operations since the last relicensing (as they describe), we request that GLHA conduct an analysis that contrasts current operations of the projects with historical operations under GNP ownership to support the claim that project operations have not changed as purported in the PAD. This includes contrasting daily seasonal impoundment levels and average daily discharge (daily minimum, maximum, and average) at all developments for the last ten years. In particular, GLHA should contrast daily minimum and maximum flows below McKay Station and North Twin Development to determine if the current range of discharges is similar to operations under the previous owner. This information will inform what additional information is necessary to determine impacts from operations to environmental resources including designated critical habitat in the mainstem which was not considered 30 years ago. We believe this data should have been provided in the June, 2021 PAD and should be submitted to us as part of the Proposed Study Plan. Raw data used in this analysis must be provided to NMFS in electronic form for our review.

**STUDY REQUEST 1:** A Study to Evaluate the Effects of Operating the Penobscot Mills and Ripogenus Dams on the Hydrology of the West Branch and Mainstem Penobscot River Using an Indicators of Hydrologic Alteration Model (IHA)

Study Goals and Objectives

Within the June 11, 2021, PAD for the Penobscot Mills Project and Ripogenus Project, the existing, relevant, and reasonably available information is insufficient in identifying potential adverse effects of project operation on a number of associated aquatic resources, including endangered Atlantic salmon and other diadromous fish communities. Potential project effects that require additional analysis include:

- Seasonal effects of project operations on flows in the West Branch of the Penobscot River downstream to the Mattaceunk Project that may affect federally listed Atlantic salmon and their designated critical habitat;
- Seasonal effects of project operation on flows in the West Branch of the Penobscot River downstream to the Mattaceunk Project that may impact survival of sea-run fish communities, including alosines, American eel, and sea lamprey;

- Consistency of project operations and reservoirs to protect state and federal water quality standards;
- Effects of the project on instream habitat in project-affected streams including minimum flows, peak flows, and ramping rates; and,
- Effects of the project on access to tributaries downstream of the projects.

The goal of this study is to develop the essential additional information to inform the nature, scope, and scale of these potential project effects. The specific information to be developed is the unimpaired[1] and regulated flow regimes for the affected reaches of the West Branch of the Penobscot River and to inform impoundment levels and operational management of dams, both individually and in the aggregate, that are protective of fish, water quality, riparian habitat, and other ecosystem functions. Specifically, the licensee should detail how the their dams, impoundments and operations currently modify hydrologic variables, including magnitude, timing, frequency, duration and rate of change in West Branch of the Penobscot River down to the Mattaceunk Project so that FERC can evaluate how these hydrologic regime modifications impact sea-run fish, including Atlantic salmon, and their habitats in order to develop license articles.

The objective of this study request is not to have FERC consider "pre-project" conditions in the analysis for this relicensing. Rather, the objective of the study is to inform future license conditions that are protective of aquatic resources in the West Branch of the Penobscot River and areas downstream of the projects that are affected by project operations by contrasting what current conditions are with conditions that are protective of aquatic resources.

Existing Information

GLHA specifically states in Volume 1 of the PAD, Section 1.6, that the impoundments and operations are used to modify flows in the mainstem Penobscot River. Specifically, "*The Project storage impoundments are managed on an annual cycle to dampen the variability and occasional extremes of seasonal precipitation and runoff through storage within the impoundments. This storage allows for continuous flows to downstream aquatic habitat and spawning areas within the West Branch and the mainstem of the Penobscot River during times of lower inflows to the system. In addition, the storage allows flows from the West Branch to be reduced during higher seasonal flow periods when the combined flows from the East and West Branches have the potential to adversely impact human life, property, and environmental resources downstream along the mainstem Penobscot River.*"

GLHA acknowledges that operation of the Penobscot Mills and Ripogenus Projects affects the mainstem of the Penobscot River. Project impoundments and flow management that affect flows in the mainstem may have direct effects on sea-run fish, including endangered Atlantic salmon, and therefore a full analysis of project effects on flows in the mainstem should be conducted.

[1] Unimpaired is the flow that is produced by the basin in its current state, but, without dams and diversions (California Department of Water Resources, Bay-Delta Office 2016).

As indicated in Volume 1 of the PAD, during the previous relicensings of the projects, a Water Use Plan (WUP) was developed that identified proposed operations of the projects that intended to balance and manage multiple competing water uses (e.g., power generation, recreation, fisheries, minimum flows, flood control). Inherent to the WUP model was the goal to maximize energy production for two, now defunct, paper mills in the Towns of Millinocket and East Millinocket. These paper mills closed in the mid-2000s. Since power generated at the Penobscot Mills and Ripogenus Projects is no longer used exclusively by the Millinocket and East Millinocket paper mills but is instead used to maximize generation output to ISO New England, past assumptions on water use at the projects are no longer relevant to current operations (e.g., stable electrical generation and demand, dilution of effluent produced by the mills). Also, the WUP was not intended or constructed to assess the effects of the projects throughout the West Branch of the Penobscot system. The WUP only investigated selected major storage reservoirs in the project area. The WUP did not consider the Millinocket Storage Project and it relied on a weekly time step which is not appropriate under current peaking operations. The WUP was used by FERC during the last relicensings to solely "evaluate the feasibility of providing alternative flows using available water" with an emphasis on maximum energy production and dilution of effluent at the two paper mills (FERC 1996). In evaluating the function of the WUP, FERC stated "Staff is not aware of any other water use model currently in use that contains a habitat evaluation module; habitat analyses are usually conducted with IFIM, independently of any hydrologic or hydraulic model." Clearly, as outlined below, this is no longer the current state of science. Furthermore, in the scoping document 3.1.4 and PAD Table 6.1-2 and 3, the proposed environmental measures for aquatic resources do not describe measures to protect sea-run fish nor does the Table of Potential Project Effects describe project impacts to sea-run fish, including federally endangered Atlantic salmon or its critical habitat.

Nexus between the Projects and Resource to be Studied and How the Results Will Be Used

Project operation, and maintenance activities directly and indirectly affect hydrology throughout all of the West Branch of the Penobscot River and the mainstem Penobscot (as described in the PAD, Vol. 1, Section 1.6). The results of this study will be used in conjunction with the results of other, resource-specific studies to evaluate potential project effects and to develop management measures and license articles that may be employed to address those effects.

Study Area and Study Sites

The study area includes: (1) the impoundment created by Ripogenus Dam including Ripogenus, Caribou, and Chesuncook Lakes and Black, Brandy, and Moose Ponds; (2) the West Branch of the Penobscot River from McKay Station to its confluence with Ambajejus Lake including the Holbrook Rearing Channel; (3) Millinocket Lake Storage Project and Millinocket Stream; (4) Ambajejus, Pemadumcook, North Twin, and South Twin Lakes; (5) the West Branch River below North Twin Development Dam; (6) the West Branch of the Penobscot River from the Back Channel below Stone Dam downstream to its' confluence with the mainstem Penobscot River, and (7) the mainstem Penobscot River downstream to the Penobscot Bay estuary.

According to the PAD, several developments in the Penobscot Mills Project (North Twin Development Dam) and the Ripogenus Project (McKay Station) operate in a peaking mode as part of their store-and-release license conditions. The Millinocket, Dolby, and East Millinocket

Development dams, although run-of-river facilities, operate in response to peaking inflows from the North Twin Project; thus, outflows of these dams also fluctuate similarly to peaking facilities.

There are no actual flow gages in the Ripogenus and Penobscot Mills Project areas. We understand that GLHA uses generation records to estimate stream flows. It is not known how accurate these estimates are in relationship to actual instantaneous flows below the projects. In order for the FERC to use these streamflow estimates as part of this relicensing, GLHA will likely need to conduct index testing to verify the accuracy of flow estimates at the Ripogenus and Penobscot Mills projects. The testing will verify existing efficiency curves at both projects. Otherwise, FERC should require GLHA to install streamflow gages below each project consistent with USGS methodology.

Hydrologic records maintained by GLHA and the previous Licensee from 1980 to 2021 will need to be compiled so that unimpaired flow can be determined for the West Branch of the Penobscot River. To develop the regulated and unregulated hydrological database for the Project, two different methods could be used: summation and proration. Given the lack of steam flow gages at the projects, summation cannot likely be used for this study. Rather, Licensee's operations data will likely be used to compute the unimpaired daily average flows for the study period.

Analysis

It is well documented that seasonal and inter-annual hydrologic variation is a dominant factor influencing ecological communities of river systems and that existing communities develop over time in response to the long-term hydrological patterns that occur (Meridian 2004). Altering the timing, frequency, or duration of naturally occurring flow events can reduce habitat diversity, disrupt migration and spawning cues for fish, and alter the survival and distribution of juvenile fish and macroinvertebrates (Meridian 2004). In general, the life history of all aquatic organisms has adapted to naturally occurring seasonal flow regimes. Based on this premise, the Indicators of Hydrologic Alteration (IHA) and Range of Variability Approach (RVA) methods were developed as part of the Nature Conservancy Freshwater Initiative (Meridian 2004; Richter et al. 1996, 1997). The IHA method provides a hydrologic analysis technique that considers the overall hydrological requirements of the system, rather than specific objectives such as a short list of species or geomorphic processes (Meridian 2004). In addition, the model defines an unimpaired hydrologic regime that is more likely to maintain or restore the natural biotic composition, structure, and function of the river system (Meridian 2004). The RVA method was subsequently developed to provide a tool that establishes flow targets based on the results of IHA analysis and goals for meeting resource objectives (Meridian 2004).

There are 32 statistical metrics that focus on descriptors of the streamflow regime that are considered to be important to the biological and physical integrity of a river. The 32 metrics derived in the IHA analysis can be clustered into five specific groups, which can then be used to assess potential environmental impact. The five groups for the IHA metrics, which are identified in the IHA protocol as described by Richter et al. (1996, 1997, and 1998), are as follows: 1) magnitude of monthly water conditions; 2) magnitude and duration of annual extreme water conditions; 3) timing of annual extreme water conditions; 4) frequency and

duration of high and low pulses; and 5) rate and frequency of change in water conditions.

Using the results of the IHA analysis, the Licensee should identify target flows and impoundment levels using the RVA described by Richter et al. (1997). The RVA approach identifies annual river management targets using the results of an IHA analysis approach for setting target flows in streams (Meridian 2004; Richter et al. 1997). The RVA approach is a river reach- or river basin-scale approach that establishes target flows for river management according to the natural (unimpaired) hydrologic regime in a river system (Meridian 2004). These management targets can then be used to help develop and implement river management strategies such as reservoir operations or stream diversions (Meridian 2004). The RVA analysis begins with a comprehensive characterization of ecologically-relevant attributes of a flow regime using the IHA approach, then uses the results to develop a flow regime that should maintain or restore the integrity of the subject river system (Meridian 2004). The method has six steps for setting, implementing, and refining flow targets and rules as presented in Richter et al. (1997).

For these reasons, we are requesting this study to evaluate the potential effects of project operation on a number of associated aquatic water resources, including endangered Atlantic salmon and other diadromous fish communities.

Study Plan Criteria

1. The goal of this study is to evaluate the effects of the Penobscot Mills and Ripogenus Projects on the hydrology in the West Branch of the Penobscot River, as well as the mainstem Penobscot River downstream to the estuary. Operation of the projects on the West Branch undoubtedly affect the timing and magnitude of flows (PAD Vol. 1, Section 1.6) in the mainstem Penobscot River and may affect the physical and biological features of the Migration Primary Constituent Element of designated critical habitat for Atlantic salmon. The results of this study will be used to establish baseline hydrologic conditions, project monitoring and assessment, development and analysis of alternatives for proposed project hydrology, potential mitigation measures, and planning additional instream flow studies as part of this relicensing. The objective of this study is to characterize metrics of hydrologic alteration due to project operational effects and then identify target flows and impoundment levels using the RVA method. The study will evaluate the following:

    - Seasonal effects of project operations on flows in the West Branch of the Penobscot River to the estuary that may affect federally listed Atlantic salmon and their designated critical habitat;
    - Seasonal effects of project operation on flows in the West Branch of the mainstem Penobscot River to the estuary that may impact survival of sea-run fish communities, including alosines, American eel, and sea lamprey;
    - Consistency of project operations and reservoirs to protect state and federal water quality standards;
    - Effects of the project on instream habitat in project-affected streams including minimum flows, peak flows, and ramping rates; and,

- Effects of the project on access to tributaries downstream of the projects.

2. NMFS is a federal resource agency with a mandate to protect and conserve fisheries resources and associated habitat. Resource management goals and plans are codified in our regulations and governing statutes. We rely on the best available data to support conservation recommendations and management decisions. This study is an appropriate request for the pre-application period.

3. The requestor, NMFS, is a federal resource agency.

4. Currently, we have little information on the effects on the current mode of operating the Penobscot Mills and Ripogenus Projects on the ecosystem of the West Branch and mainstem of the Penobscot River. Data collected during the past relicensing is not applicable to this relicensing since the mode of operation has changed from powering paper mills to maximizing electrical output to ISO New England. Contemporary data on inflows, reservoir level management, and project discharge is necessary to inform an IHA to provide meaningful information on the degree to which the hydrology of the West Branch of the Penobscot River to the estuary continues to be altered as a result of project operations and to inform license articles related to the minimization of effects on fisheries resources.

5. Project operations directly affect the habitat in the West Branch of the Penobscot River as well as the mainstem Penobscot River. The storage of water in the large reservoirs created by the Ripogenus, North Twin, and Millinocket Dams substantially changes the hydrologic conditions in the river downstream of the project by altering the timing and magnitude of spring flows in the watershed. Migratory fish rely on hydrologic cues to aid them in their migration. Rapid changes and multiple changes in flow can impact resident and migratory fish behavior, spawning, and rearing, as well as food production. The results of this study will be used to determine the necessity and scope of potential protection, mitigation, and enhancement measures, as well as provide sufficient information that can be used to evaluate the effects of the project on Atlantic salmon and their critical habitat.

6. In order to assess the impacts of flow regulation on Project-affected streams, flow characteristics will be computed and comparison tables prepared for the regulated and unimpaired flow conditions on the stream locations within the study area. Then, the IHA methodology will be applied to assess the effects of regulated flows on aquatic resources (Richter et al. 1996). Richter suggests that the hydrologic attributes of a stream can be described by five fundamental groups of statistics:

   Group #1: Magnitude of monthly water conditions
   Group #2: Magnitude and duration of annual extreme water conditions
   Group #3: Timing of annual extreme water conditions
   Group #4: Frequency and duration of high and low pulses
   Group #5: Rate and frequency of change in water conditions.

Once the IHA model is developed, the Licensee, in consultation with state and federal resource agencies and the Penobscot Indian Nation, will use the RVA approach to help develop and implement river management strategies such as target flows and reservoir operations that are protective of aquatic resources.

7. This study would require a desktop analysis. The preliminary estimated cost for the study, broken down by major tasks, is as follows:

| | |
|---|---|
| Research and Data Compilation | $50,000 |
| Analysis | $65,000 |
| Reporting | $50,000 |
| Total ……. | $165,000 |

We note the Commission has approved similar study request using the IHA and RVA methods during the relicensing of the following FERC licensed projects: Jackson (WA) (P-2157); McCloud-Pit (CA) (P-2106); Drum-Spaulding/Yuba-Bear (CA) P-2310, P-2266, P-2784; Merced (CA) (P-2179); Snohomish County PUD No.1 (WA) (P-14295); Bucks Creek (CA) (P-619); Skagit (WA) (P-553); Phoenix (CA) (P-1061)

**STUDY REQUEST 2:** A Study to Evaluate Project Effects on River Temperature in the West Branch and Mainstem Penobscot River

Study Goals and Objectives

GLHA specifically states in Volume 1 of the PAD, Section 1.6, that the impoundments and operations are used to modify flows in the mainstem Penobscot River. Dams and their impoundments significantly reduce river flow that can increase warming. Given that the West Branch drains 24% of the entire Penobscot Basin (NMFS, 2009) and approximately 57% of the river is impounded by dams (USACOE, 1990), the dam impoundment and operations that modify flows in the mainstem Penobscot, may also modify water temperatures that could affect survival of sea-run fish, including endangered Atlantic salmon.

Existing Information

The controlled releases designed to "dampen the variability and occasional extremes of seasonal precipitation" in the West Branch and mainstem Penobscot River (Penobscot PAD Vol. 1) directly affect Atlantic salmon critical habitats in the mainstem Penobscot that may directly impact survival of Atlantic salmon and other diadromous fish. Dams and their impoundments significantly reduce river flow that can increase warming. Changes in streamflow, including dam impoundments and flow management through dams, significantly affect water temperatures due to changes in thermal capacity with water temperature being inversely related to discharge (Webb et al. 2003).

Water temperature is one of the most important environmental factors affecting all forms of aquatic life in rivers and streams (Annear et al. 2004). Temperature is especially important for Atlantic salmon given that they are poikilothermic (i.e. their body temperatures and metabolic processes are determined by temperature). Temperature can be a stimulant for salmon migration,

spawning, and feeding (Elson 1969). Temperature can also significantly influence egg incubation success or failure, food requirements and digestive rates, growth and development rates, vulnerability to disease and predation, and may be responsible for direct mortality (Garside 1973; Spence et al. 1996; Peterson et al. 1977, Whalen et al. 1999).

Nexus between project operations and effects

The controlled releases designed to "dampen the variability and occasional extremes of seasonal precipitation" (GLHA 2021) may directly affect the physical and biological features of the Migration Primary Constituent Element of designated Atlantic salmon critical habitat in the mainstem Penobscot and may directly impact survival of Atlantic salmon and other diadromous fish. The combined effect of a warming climate along with altered stream flows can negatively affect the reproductive success of salmonids (e.g. Mantua *et al*. 2010).

Study Area and Study Sites

The study area includes: (1) the impoundments created by Ripogenus (2) the West Branch of the Penobscot River from Ripogenus Dam to the Medway Dam, including all the impoundments created by the Penobscot Mills Project (3) the West Branch of the Penobscot River from the Medway Dam downstream to its' confluence with the mainstem Penobscot River, and (4) the mainstem Penobscot downstream to the Penobscot Bay estuary.

Analysis

Specific information that needs to be collected as part of the study are:

- Model the seasonal effects of the Project's impoundments and flow modifications on the West Branch and mainstem Penobscot river water temperatures compared to river water temperatures if the West Branch were unimpaired by dams. The study area includes: (1) the impoundment created by Ripogenus Dam including Ripogenus, Caribou, and Chesuncook Lakes and Black, Brandy, and Moose Ponds; (2) the West Branch of the Penobscot River from McKay Station to its confluence with Ambajejus Lake including the Holbrook Rearing Channel; (3) Millinocket Lake Storage Project and Millinocket Stream; (4) Ambajejus, Pemadumcook, North Twin, and South Twin Lakes; (5) the West Branch River below North Twin Development Dam; (6) the West Branch of the Penobscot River from the Back Channel below Stone Dam downstream to the mainstem Penobscot River at the Mattaceunk Project (P-2520), and the mainstem of the Penobscot down to Milford Dam.
- Thermal profile of the Ripogenus and North Twin impoundments
- Development of an alternatives analysis to provide information on the efficacy of potential PM&E measures related to project effects on stream temperature, including, but not limited to: flow management, variable depth deep water turbine intakes, and impoundment management.

Study Plan Criteria

1. The goal of this study is to evaluate the project's effects on river temperature in the West Branch and mainstem Penobscot River.

2. NMFS is a federal resource agency with a mandate to protect and conserve fisheries resources and associated habitat. Resource management goals and plans are codified in our regulations and governing statutes. We rely on the best available data to support conservation recommendations and management decisions. This study is an appropriate request for the pre-application period.

3. The requestor, NMFS, is a federal resource agency.

4. Currently, there is no information on the effects of operating the Penobscot Mills and Ripogenus Projects on ambient river temperatures in the West Branch of the Penobscot River or mainstem Penobscot River. This information is necessary for us to inform potential license requirements to minimize the effects of operating the projects on temperatures to ensure appropriate operational measures and procedures are in place to afford necessary protections of sea-run fish and their ecosystems.

5. The controlled releases designed to dampen the variability and occasional extremes of seasonal precipitation (GLHA 2021) may directly affect the physical and biological features of the Migration Primary Constituent Elements of designated Atlantic salmon critical habitat in the mainstem Penobscot, and may directly impact survival of Atlantic salmon and other diadromous fish. The operations of the Penobscot Mills Projects and Ripogenus Dam reduce the magnitude and frequency of flow variability throughout the Penobscot River (GLHA 2021). Changes in streamflow, including dam impoundments and flow management through dams, significantly affect water temperatures due to changes in thermal capacity with water temperature being inversely related to discharge (Webb et al. 2003). The combined effect of a warming climate along with altered stream flows can negatively affect the reproductive success of salmonids (e.g. Mantua et al. 2010).

6. The procedures for modelling stream temperature are consistent with generally accepted scientific practice necessary to inform license conditions. Modelling the seasonal effects of flow modifications and conducting a thermal profile of the impoundments will provide necessary information to garner project effects on water temperature and mitigation measures that can be taken to offset those effects. A summary of the information and findings gained from this effort will be included in the application for new license. The information gathered from this modeling exercise will be used to assess potential effects on Atlantic salmon critical habitat, Atlantic salmon and other diadromous fish communities in the Project Area including the mainstem of the Penobscot and will help inform license articles.

7. This study would require a desktop analysis. The preliminary estimated cost for the study, broken down by major tasks, is as follows:

| | |
|---|---|
| Research and Data Compilation | $50,000 |
| Analysis | $65,000 |
| Reporting | $50,000 |

Total ……..... $165,000

**STUDY REQUEST 3:** A Study to Evaluate Future Flow and Water Temperature Scenarios

Goals and Objectives

GLHA specifically states in Volume 1 of the PAD, Section 1.6 that the impoundments and operations are used to modify flows in the mainstem Penobscot River potentially exacerbating the effects of climate change. For example, storage of water during the springtime may reduce survival rates of emigrating Atlantic salmon smolts in the lower reaches of the Penobscot River. Dams and their impoundments slow the rate of water moving through a river and subject Atlantic salmon smolts to altered temperature regimes that can have significant biological consequences (Angilletta Jr. et al. 2008). Changes in streamflow, including dam impoundments and flow management through dams, significantly affect water temperatures due to changes in thermal capacity with water temperature being inversely related to discharge (Webb et al. 2003). The combined effect of a warming climate along with altered stream flows can negatively affect the reproductive success of salmonids (e.g. Mantua *et al*. 2010). Furthermore, though there is some uncertainty in forecasting future climate conditions, there is no uncertainty that the climate in Maine is warming and will continue to warm, and as a consequence, precipitation types, rates, and duration will also change (*see* Fernandez et al. 2020). Thus, the licensee should evaluate a number of plausible future climate scenarios and how their dams and operations may affect these future scenarios to ensure appropriate operational measures and procedures are in place to afford necessary protections to sea-run fish and their ecosystems. Given that the West Branch drains 24% of the entire Penobscot Basin (NMFS, 2009) and approximately 57% of the river is impounded by dams (USACOE, 1990), it is likely that the dam impoundment and operations that modify flows in the mainstem Penobscot may also modify water temperatures that could affect survival of sea-run fish, including endangered Atlantic salmon.

Existing Information

The controlled releases designed to "dampen the variability and occasional extremes of seasonal precipitation" in the West Branch and mainstem Penobscot River (GLHA 2021) directly affect the physical and biological features of the Migration Primary Constituent Elements of Atlantic salmon critical habitat in the mainstem Penobscot (74 FR29300), and thus impact survival of Atlantic salmon and other diadromous fish. The geography, hydrology, and location of the West Branch may contain freshwater habitats that have greater propensity for climate resilience relative to the rest of the state of Maine and to areas that maintain remnant populations of Atlantic salmon. Because of the dams on the West Branch, these climate-resilient habitats are no longer available to Atlantic salmon and other diadromous fish. In summary, temperatures in the State of Maine are increasing as a result of climate change. The average annual air temperature has increased 3.2 degrees Fahrenheit (°F) in the last 124 years; Maine has experienced the six warmest years on record since 1998; and the Northeast is warming faster than any other region in the contiguous U.S. (Karmalkar & Bradley 2017). Along with a warming climate, Maine has seen changes in precipitation patterns as well. The average annual precipitation has increased 15% (5.8 inches) since 1895 with the fastest rate of increase happening since 1960 (more the twice the rate of the long term average); average annual snowfall for Maine has decreased 20% (2.3 inches) over the same time period; most of the increases in precipitation are associated with increased intensity and duration of fall storm events; and despite the increases in annual precipitation, drought events in Maine have become more severe both in duration and magnitude

across the entire state (Fernandez et al. 2020). We contend that the flow modifications at the Penobscot Mills and Ripogenus dams in the West Branch may further exacerbate the effects of climate change (including river flows and temperature) if future climate scenarios are not accounted for in project operations.

Scenario planning is a tool that is used to inform decision-making when there are a range of plausible but uncertain future scenarios, such as climate change (Star et al. 2016). Scenario planning uses a structured process to identify a range of actions that can be taken under different plausible future scenarios. For example, if a future scenario plays out that Maine's climate is significantly warmer and wetter over the next 40 years, then the licensee could have already identified the appropriate mitigation measures, and put in place the necessary tools to adapt to a warmer and wetter environment.

Scenario planning will also allow the licensee to plan seasonally. The Gulf of Maine Council in partnership with the National Weather Service produces quarterly seasonal climate forecasts that provide the most likely climate outlook for the Northeast, including Maine (*https://gulfofmaine.org/public/climate-network/climate-outlook/*). The scenario planning will inform GLHA on appropriate short-term mitigating measures that are necessary to protect aquatic ecosystems in the West Branch and mainstem Penobscot in advance of seasonal climate scenarios playing out.

Nexus between project operations and effects

The controlled releases designed to dampen the variability and occasional extremes of seasonal precipitation (GLHA 2021) directly affect Atlantic salmon critical habitats in the mainstem Penobscot and may directly impact survival of Atlantic salmon and other diadromous fish. The operations of the Penobscot Mills Projects and Ripogenus Dam reduce the magnitude and frequency of flow variability throughout the Penobscot (GLHA 2021). Changes in streamflow, including dam impoundments and flow management through dams, significantly affect water temperatures due to changes in thermal capacity with water temperature being inversely related to discharge (Webb et al. 2003). The combined effect of a warming climate along with altered stream flows can negatively affect the reproductive success of salmonids (e.g. Mantua *et al*. 2010). An analysis of how these dams and their operations may exacerbate potential future climate conditions and identification of mitigating measures that can be taken to offset these impacts, in conjunction with the IHA and Temperature studies that we have requested, is necessary to inform potential license requirements.

Study Area and Study Sites

The study area includes: (1) the impoundments created by Ripogenus (2) the West Branch of the Penobscot River from Ripogenus Dam to the Medway Dam, including all the impoundments created by the Penobscot Mills Project (3) the West Branch of the Penobscot River downstream to its' confluence with the mainstem Penobscot River, and (4) the mainstem Penobscot downstream to the Penobscot Bay estuary.

Analysis

Specific information that needs to be addressed through this study are:

- Identify a minimum of four plausible future climate scenarios considering RCP 4.5 and 8.5 projections for temperature and any future projections for precipitation. Consider likely scenarios such as increases in rainfall, increases in water temperature, decreases in snowpack, and increases in frequency and duration of drought events.
- For each scenario, model the seasonal anticipated future effects of impoundments and flow modifications on river temperatures and flow in the West Branch and mainstem compared to an unimpaired river.
- Identify a range of operational modifications, including flow management, variable depth deep water turbine intakes, and impoundment management, that would be necessary to mitigate the effects of each scenario necessary to afford protections to diadromous fish in the mainstem Penobscot, including endangered Atlantic salmon and their ecosystems.
- Assess how impoundment operations including associated rule curves will be affected by projected future flows in the West Branch of the Penobscot River.
- Assess how access to impoundment tributaries for fish and other aquatic life will be affected by future flows in the West Branch of the Penobscot River.
- Assess how water quality including temperature and dissolved oxygen levels throughout the project area will be affected by future flows in the West Branch of the Penobscot River and designated critical habitat for Atlantic salmon in the mainstem of the Penobscot River below Medway Dam.

Study Plan Criteria

1. The goals of the study are to evaluate how operation of the Ripogenus and Penobscot Mills Projects will affect future stream flows and temperatures in the West Branch of the Penobscot River and mainstem Penobscot River.
2. NMFS is a federal resource agency with a mandate to protect and conserve fisheries resources and associated habitat. Resource management goals and plans are codified in our regulations and governing statutes. We rely on the best available data to support conservation recommendations and management decisions. This study is an appropriate request for the pre-application period.
3. The requestor, NMFS, is a federal resource agency.
4. Currently, there is no information on the effects of operating the Penobscot Mills and Ripogenus Projects on future stream flows and temperatures in the West Branch of the Penobscot River or mainstem Penobscot River. This information is necessary for us to inform potential license requirements to minimize the effects of operating the projects on changing stream flows and temperatures to ensure appropriate operational measures and procedures are in place to afford necessary protections of sea-run fish and their ecosystems.

5. Changes in streamflow, including dam impoundments and flow management through dams, significantly affect water temperatures due to changes in thermal capacity with water temperature being inversely related to discharge (Webb et al. 2003). An analysis of how these dams and their operations may exacerbate potential future climate conditions and identification of mitigating measures that can be taken to offset these impacts, in conjunction with the IHA and Temperature studies that we have requested, is necessary to inform potential license requirements.

6. Downscaled temperature and precipitation data are now routinely analyzed to assess future risks, and can provide a range of future likely scenarios. The use of scenario planning in a risk assessment framework has become the generally accepted practice in the scientific and water management communities for developing actions and strategies to address plausible future climate scenarios. This study request will describe the current practices for the use of climate projections in a risk management framework, in use and mandated by other federal and non-federal water management, resource, and infrastructure planning processes.

   Project operations directly affect the habitat in the West Branch of the Penobscot River and the mainstem Penobscot River. The storage of water in the large reservoirs created by the Ripogenus, North Twin, and Millinocket Dams entirely changes the hydrologic conditions in the river downstream of the project. Impoundments and flow modifications change the thermal exchange rate and thermal capacity of rivers as well as dissolved oxygen levels necessary to support aquatic life. Water temperature affects the migration, movement, spawning and rearing of diadromous fish. Endangered Atlantic salmon are particularly sensitive to relatively small changes in temperature as they have a very narrow range of temperature tolerances. The results of this study will be used to determine the necessity and scope of potential protection, mitigation, and enhancement measures, as well as provide sufficient information that can be used to evaluate the effects of the project on Atlantic salmon and their critical habitat.

7. This study would require a desktop analysis. The preliminary estimated cost for the study, broken down by major tasks, is as follows:

| | |
|---|---|
| Research and Data Compilation | $25,000 |
| Analysis | $35,000 |
| Reporting | $25,000 |
| Total ……. | $85,000 |

For projecting likely changes in climate and their future effects on GLHA's projects and the surrounding natural resources, refer to Star *et al.* (2016).

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Paul Johnson, Oakland, Maine, ME.
Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E. Room 1A
Washington, DC 20426

Comments on Scoping Document 1, Ripogenus Project (FERC 2572-133) and Study Requests

In the late 1980's and early 1990's, when the Ripogenus Project was under consideration for re-licensing, I was the Maine Department of Inland Fisheries and Wildlife Regional Fishery Biologist responsible for fishery management in Chesuncook Lake and in the West Branch of the Penobscot River below Ripogenus Dam. In that capacity I was intimately involved in the re-licensing studies and recommendations responsible for some of the conditons included in the current license issued for the Ripogenus Project. Now that this license is up for renewal again, I have the following comments and recommendations.

The so-called Holbrook Side Channel (Article 406 in the current license) was designed to provide habitat with appropriate flows to increase production of young, wild landlocked salmon for the West Branch population. I recommend studies to determine if current flows throughout the year are adequate to meet the salmon parr production objectives established for this side channel. In renewing the license, it is essential to include a condition prescribing that flows in this side channel will remain adequate for salmon parr production at all flows in the West Branch downstream of Ripogenus Dam. I also recommend a study to determine the suitability for rearing salmon parr in the side channel located on the south side of the West Branch just downstream from Little Ambajackmockamus Falls.

Flows in the Upper Gorge between Ripogenus Dam and McKay Station have not met the objectives for this section of river for the past 25 years! Article 401 of the current license requires a July 1 - September 30 discharge of 100 cfs into the Upper Gorge to provide a cool flow that would attract adult salmon and increase fishing opportunity in the gorge during this period. The recommendation for this flow and its timing was based on observations in years prior to the 1990's, when minimum flows discharged to the West Branch with McKay Station shut down were provided through a deep gate in Ripogenus Dam – hence the cool water. Unfortunately, for the past 25 years the 3-month discharge has been through a small sluice gate that provides warm, surface water to the Upper Gorge, defeating the purpose of Article 401 – 25 years of lost mitigation/enhancement. I recommend 1) studies to determine an appropriate annual minimum flow for the Upper Gorge, and 2) that a new license contain a condition requiring that the 1 July 1 – September 30 flow in the Upper Gorge be provided through a deep gate in Ripogenus Dam, or through an alternative to a deep gate that will provide at least 100 cfs from deep water, not surface water, in Ripogenus Lake.

Thank you for the opportunity to comment.

Paul Johnson

PO Box 512
35 Hammond Drive
Oakland, ME 04963
Phone: 207-465-2074
Email: skoghem04963@outlook.com

Sarah Sindo, Millinocket, ME.

My name is Sarah Sindo, and I was born and raised in Millinocket. From May to October, I reside and work at mile 28.5 on the Golden Road at Chewonki Big Eddy Campground. From November to April I am a resident of Kingfield, ME.

I am wrapping up my seventh season here. The campground is mainly known as a fly fishing destination as the West Branch is a world renowned fishery. The native landlocked salmon and brook trout in the river attracts folks from all over the country. There are fishermen that have been coming here to fish these waters for 30+ years, and have told me first hand how much it has changed over the years.

I am writing today with two concerns.

First is my concern with the water levels as they stand today. Ripogenus Impoundment is down 28 feet; it's the lowest people have ever seen it. There are not many people who have eyes on the West Branch 24/7 like I do. I see firsthand how this river is managed. There were a handful of 90 degree and humid days this summer that the river flow was between 3,000-3,400 cfs. There was even one evening from 5-9pm it got bumped from 3,000 to 3,400 for a 4 hour window. The average flow this summer was 1,800-2,200 cfs. So to see 1,000+ cfs increase was a large jump in flow. Considering the drought and extremely low level of Ripogenus Lake, running that high of a flow out of McKay Station was a grave error in water management.

Secondly, I have been witness to at least 1-2 low water excursion events each of the seven seasons I have been here. An outage will occur at McKay Station resulting in a downriver flow of 300-400 cfs, which comes from Ripogenus Dam. The river will stay at this level for 2-4 hours before McKay Station is restored. Not all, but some of these low water excursions, I have witnessed crayfish and other invertebrates in the now dewatered sections of the river, mostly along the shoreline.

I would like to see impact studies done on the river fluctuations and the potential impact it brings to the invertebrates and fishery.

I hope you will consider my concerns, along with the others, before you move forward with the re-licensing. If this river continues to be managed as it has, it will be forever changed in a negative way and its impacts would be widespread.

Thank you,

Sarah Sindo

Brendan Alterio, Pownal, ME.
When the lake is drawn down like present it diminishes the view of Mt. Katahdin. Totally ruins the aesthetics the we have all come to enjoy.

Chad t Mclaughlin, East Millinocket, ME.
As a family friend of a Lease holder I would respectfully request a flow study of Rip Dam off of Chesuncook lake.  Over the last couple years I have noticed a decline in the fishing, snowmobiling, and boating due to the major changes in the lake levels.  I have been coming up here for years fishing and sledding and it has been majorly impacted due to the level changes.  I believe there is no reason for the water levels to be this low.  All the other lakes in the region are close to full capacity for this time of year.  Can you explain why this is happening to this lake?  Is this being done for the rafters, fishing of the river? What about all the people up stream of the dam? Have they not been taken into consideration? Do you realize that this is the 3rd largest lake in the state of Maine with NO development? This is a gem in the shadows of Mount Katahdin and I don't want to see it go to the waste side.  Please take all of this into consideration and fix this major problem.  Thanks

Douglas R Binder, Medway, ME.
For 22 years, I have been coming to my mother and step-father's camp at Chesuncook Lake. I am not a year round resident, but I spent a considerable amount of time there, through all seasons. I am concerned about the water levels during late summer and fall months at Chesuncook Lake chain, to include Ripogenus Lake and Caribou Lake. Every year, I have to pull my boat from the lake, as the water levels get so low in late summer, it is impossible to know the hazards and obstructions that could result in personal injury to myself and my passengers, and also damage to my boat. I have also noticed the consistency of the fishing has also suffered, and it has declined over the past 20 years. It is pretty obscene at the amount of fluctuation of the water levels, especially since other lakes in the same water system, remain mostly full all year. What is this doing to species of fresh water clams and muscles, that live in the shallows that end up being above the water level half the year? How can they survive? Beyond the personal impact on recreational use of the lake, the ecological impact of such massive fluctuation of water levels, of 20 feet or more, every year is devastating to wildlife populations of water base life.

E Drew Fayle, Glenburn, ME.
As a son of a lease holder on Chesuncook Lake, I would like formally request a Flow Study of the lake. The Water level of the Chesuncook and Rip have been excessively level changes which make navigating the lake very difficult. I would also like to make notice on the wasteland the lake looks like due to the water level being drawn down. I would also like to have this completed due safety concern when snowmobiling on the lake due to exposed rocks and pressure ridges. Again I want to Request a Flow Study on the Chesuncook Lake and other bodies of water.

Gregory Friel, Millinocket, ME.
I would like to comment on the Millinocket Stream water flow levels. I am a local high school outdoor education instructor, registered Maine guide, life long Millinocket resident and parent. I have used Millinocket Stream with my outdoor education class, guiding, kayaking and fishing with my family for 35 plus years. I have some strong concerns about the low water flows over the past 4-5 years.The stream has gone from an absolute gem for outdoor recreation, canoeing, kayaking, fishing and guiding to a stream so shallow that it is no longer able to allow passage of a canoe or kayak which only draw several inches of water. This stream has great potential to be a recreational hub but it needs water, the flow levels of 65-75 cfs seems to be the new normal but is not the historical flow. I would like to see the minimum flows increase to a flow that allows for canoe passage without having to get out and drag the vessel, 150-200 cfs isn't much but would probably be acceptable. The water is constantly pumped out of Millinocket Lake across to the Pemadumcook Chain of lakes which has resulted into pure neglect of Millinocket Stream as a resource for recreational opportunities. With the number of streams flowing into Millinocket lake it should be manageable to meet at least a flow of 200 cfs. I know Brookfield likes to keep the camp owners on Millinocket lake happy with a full lake and I believe this can still happen with Millinocket Stream receiving a little more water and the Pemadumcook chain receiving a little less. No I'm not a camp owner but think recreational users need the same considerations that the camp owners are getting from Brookfield power. The water in Maine belongs to the all of the people in the state of Maine not just the camp owners and certainly not the ones in control of the dams. Thanks you for any considerations given to Millinocket Stream.

October 9, 2021

Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**RE: Ripogenus Hydroelectric Project (FERC No. 2572)**
**Comments on PAD and SD1 Documents**

Dear Secretary Bose:

I am writing as a waterfront property owner within the above referenced re-licensing project area. My seasonal camp is on Caribou Lake (Lot CA8), within the Ripogenus impoundment created by Ripogenus Dam.

I have reviewed the Pre-Application Documents (PAD) filed by Brookfield dated June 11, 2021, as well as Scoping Document 1 (SD1) and offer several comments pertaining only to FERC No. 2572.

My concerns relate to the significant, persistent lake water level drawdowns that have occurred over the last 5 years of owning my camp. The normal full pond elevation of 941.59 feet has only been periodically reached over the last 5 years. Lake drawdown to levels over 20 feet occurs during the summer recreational boating season (ice-out to Labor Day). Basically, my recreational access has been eliminated during the summer months due to excessive lake drawdown. Dragging a 300 pound boat 200 – 300 feet over boulders, sharp slate and fractured ledge is not feasible. Although not stated in these reports, it is worth repeating that permanent docks attached to the lake bottom are not allowed in the Ripogenus impoundment, and I have no problem with that.

Photo 1 on the next page is from Labor Day, 2021 when the lake drawdown was approximately 21 feet. The lake level had been this low for several weeks. The distance from the shoreline to the water's edge was 288 feet (measured with 100 foot surveyors tape). In these conditions, my access is limited to a canoe and kayak.

Recreational access and lake level stability in the Ripogenus impoundment during the summer months are two issues I wish to see considered in the NEPA process.



**Photo 1. View on Labor Day, September 6, 2021. Distance from edge of grass to water is 288 feet. Upland vegetation is spreading in the first 100 feet. Rock in foreground is approximate 942 pool elevation.**

The second photo below shows the bouldery, rocky terrain exposed for much of the summers of 2020 and 2021. Launching and removing a motorized boat is difficult at best.



**Photo 2. View towards Caribou Lake from Lot CA8 on September 6, 2021.**

Since launching a boat is not possible from the camp, I have checked out the one public access point. The Ripogenus Project existing recreation facility on Caribou Lake consists of one boat put-in (Caribou Lake Put-In). I checked the put-in 3 times in summer 2021 and 3 times in summer 2020 and the water level was below the put-in – I would not use my trailer on it.

**Comments on PAD Document**

The PAD contains the following statement in a couple places:

> *During normal operation and normal inflow years, the Ripogenus impoundment elevation is held relatively stable at 941.6 feet during the summer months…*

This has NOT been the case since 2015 when I purchased my camp. I am told that this may have been true back when Great Northern operated the dam, but has not been the case since Brookfield began operations.

**Comments on SD1 Document**

GLHA proposes to continue their current operations under the new license with no changes in operation. The proposed operations for the new license address downstream minimum flow requirements only (*Section 3.1.4*). Upstream impacts and/or mitigation relative to lake water levels are not mentioned.

No mention of lake level requirements for the Ripogenus impoundment is made. The SD1 document relies on the same incorrect assumption as the PAD document, namely, that: "… *the Ripogenus impoundment elevation is held relatively stable at 941.6 feet during the summer months".*

Likewise, *Sections 4.1.2 and 4.1.5* largely focus on downstream issues to be addressed in the NEPA document. No specific mention of recreational access or the impact of significant summer lake level drawdowns in the Ripogenus impoundment is made.

At a minimum, the NEPA process should include a presentation and review of existing historical discharge and lake level data for Ripogenus Dam. The lake level fluctuations should be analyzed and correlated with precipitation and discharge. It appears that the lake level fluctuations and drawdowns correlate most directly with Rip dam releases/discharges. To say that, 'well, it has been a drought year' is not adequate.

**Proposed Mitigation Measures for New License**

According to the SD1 there are 3 options for the new license: No Action, Proposed Action, and Alternative to the Proposed Action. In my opinion, the No Action and Proposed Action options are not acceptable. An alternative to the proposed action, that incorporates seasonable lake level requirements for the Ripogenus impoundment, is needed to provide recreational access during the boating season (Ice-out to Labor Day).

The lake level requirements for nearby North Twin Lake provide an example of a workable solution for the Ripogenus impoundment, which could be worded as follows:

*From ice-out to Labor Day, the Ripogenus impoundment is refilled and is maintained at a relatively stable target elevation of 940 feet (within 1.6 feet from normal full pond elevation) plus or minus 0.5 feet.*

Thank you for considering these comments. Hopefully, recreational issues/lake level requirements for the Ripogenus impoundment will be considered in the re-licensing process.

Respectfully submitted,

Michael J. Hudson
618 S. Clary Road
Jefferson, Maine 04348

Email: mjhudson655@gmail.com
508-733-0855

Member, Caribou and Chesuncook Lake Lot Owners Association (CCLLOA)

Kimberly D. Bose
Federal Energy Regulatory Commission
888 First Street, N.E. Room 1A
Washington, DC 20426

October 8, 2021

*Filed Electronically (as a local fishing and instream-flow science expert)*

Comments on the PAD and Commission staff's Scoping Document 1, Ripogenus Project (P-2572-133) and Penobscot Mills Project (P-2458-247)

**Instream-Flow Management for the West Branch of the Penobscot River, Maine: Hydropower vs. Recreational-Use Conflicts**

ROBERT L. VADAS, JR.[1]

*Department of Fish and Wildlife Conservation*
*Virginia Polytechnic Institute and State University*
*Blacksburg, VA 24061-0321*

*Abstract.*-Above natural migration barriers for sea-run fish, landlocked Atlantic salmon formerly provided an impressive fishery in the West Branch of the Penobscot River, ME. This once-stocked run has declined in distribution and abundance recent decades, due partly to reduced rainbow smelt runs (prey). This dammed river has also been managed for lucrative whitewater rafting/tubing companies more recently, via changes to the instream-flow regime that apparently have reduced salmon productivity. Moreover, changes in fishing regulations and elimination of former fishing bonanzas during holidays (when river flow for hydropower production was reduced) have impacted angling success for this wilderness river. Although Trout Unlimited (TU-National) once advocated for instream-flow changes that were better for salmonids here, based on past PHABSIM (Physical Habitat Simulation) studies, their “spoiler” role really didn’t benefit this salmon fishery (despite a subsequent ‘Trout’ magazine article that overemphasized its angling value). Unfortunately, a “cookbook” management approach has not worked here.

[1]*Present address:*
2909 Boulevard Rd. SE, Olympia, WA 98501-3971, USA, Phone: (360) 705-2231, E-mail: bobesan@comcast.net.

I submit the present information as an instream-flow scientist, including work on both Atlantic and Pacific salmonids (Vadas 2000; Vadas and Vadas 2005; Vadas et al. 2008, 2016) and ecohydrologic considerations for other freshwater and estuarine vertebrates (Vadas 1994a, 2003; Khatun et al. 2020) and riparian trees (Vadas and Weigmann 1993; Vadas and Sanger 1997; Hughes and Vadas 2021). I also have much angling experience in the West Branch of the Penobscot River, ME.

Over a decade ago, my father and I published a short note in 'Trout' (Vadas and Vadas 2005), critiquing a previous tribute article in that magazine (McGurren 2002) that over-touted the landlocked (past-stocked) fishery for Atlantic salmon (*Salmon salar*) in the West Branch. Although this wilderness river above natural fish barriers is still clean/cold, angling success has declined in recent decades (Table 1; see below). Our experience has collectively included (a) regular angling and camping/cottage outings on the West Branch since the late 1960s and (b) my consulting services on instream-flow issues there two decades ago for TU-National (Appendix 1). Since 2005, my family and friends have continued to fish this river, with no major, widespread improvement in fishing success since the heydays of the 1960s to 1980s. Indeed, the only mainstem sections with any recent summer/fall angling success have been below McKay Station powerhouse and well-downstream near Sourdahunk Stream (B. Grandchamp and E. Spear, pers. comm. 2020-2021), whereas other, previous "hotspots" up- and downstream have not been productive in the new millennium (RLV, pers. obs.). I do agree with McGurren (2015), however, that the West Branch provides better salmon fishing than the other three headwater-river forks.

Although McGurren (2002) indicated that some 10 lb (4.5 kg) salmon may reside there since the 1920s planting of this stock, we haven't heard of such large fish being caught (Table 1), based on discussions with the local game warden and fish biologist (Vadas and Vadas 2005). The largest salmon angled during the West Branch heyday (prior to the mid-1990s) were 6-7 lb (~3 kg) fish collectively taken near the McKay Station and downstream at Sourdahunk Falls (a fish-migration barrier). Larger fish caught there, however, have usually been much smaller than this, particularly more recently since stocking ended in 1978 (op. cit.). Such fish sizes reflect their landlocked life cycle, as *S. salar* adults (total length = 47-90 cm = 18.5-35") do not reach the maximum size of anadromous salmon (140 cm = 55") in the Atlantic Northeast (Lee et al. 1980). Rather, their body sizes are more similar to Atlantic salmon grilse, which spend only one year at sea in eastern Canada (Table 1). Notably, landlocked salmon of 18-21" (46-53 cm) TL should be 2.5-3.5 lbs (1.1-1.6 kg) in weight (Behnke 1988). Table 1 shows notable size differences of larger

salmon caught in recent decades here, as compared to sea-run Atlantic salmon from one of the best fishing rivers in eastern Canada, i.e., the Main Southwest Miramichi River near Doaktown, NB (Belding 1934; Elson 1957; Vadas 2002; FLAO 2021). In more recent decades, the strong rainbow smelt (*Osmerus mordax*) runs of the West Branch – which once provided salmon food when Chesuncook Lake (Ripogenus Dam) outflows were high (McGurren 2002) – have diminished along with the salmon runs and adult growth (body sizes) (Vadas and Vadas 2005; E. Spear, pers. comm. 2021; cf. Behnke 1988). A similar salmon-smelt problem has occurred farther upstream in the most-remote segment of this river, i.e., between Ripogenus and Seboomook dams that formerly provided good salmon fishing (Vadas and Vadas 2005). Of interest for future salmon-abundance projection is the return of dirt-road conditions below Ripogenus Dam, given the conversion of pulp-and-paper mill to paper-recycling operations in East Millinocket, as logging (and thus truck transport) decreased (RLV, pers. obs.). Despite declining fisheries success in recent decades, it's still possible to catch over one salmon in 20 h in the best habitats (pers. obs.), which is considered to be a normal catch cate for landlocked stocks (Behnke 1988). Fortunately, forested-conservation easements are important along both riverine forks of the upper Penobscot River drainage (BGNP 1992), within sight of Mt. Katahdin (northern end of the Appalachians) as scenic destinations.

As logging activities declined, the top business operation in the West Branch became whitewater rafting and (more recently also) tubing (Vadas and Vadas 2005, pers. obs.; cf. BGNP 1992). Although there is better cooperation between these companies and anglers since the successful opposition to the downstream-proposed "Big A" dam in 1984 (Klausmeyer 2002; McGurren 2002), there were serious conflicts that have fortunately decreased more recently, except for naïve tubing enthusiasts (Vadas and Vadas 2005, pers. obs.). The remaining drawback of whitewater rafting, however, is that low flow/electrical-production weekends no longer occur during summer holidays, which once provided the best fishing action (op. cit.). Indeed, lower flows are best for fishing there, with 1300-2000 cfs (37-57 $m^3/s$) being optimal for wading anglers and up to 3000 cfs (85 $m^3/s$) for boat anglers (McGurren 2002). This concords with literature data, for which whitewater rafting has higher instream-flow requirements than do other recreational activities like angling, swimming, and aesthetics (Fritschen et al. 1984; Beecher 1990), thus requiring compromises even without consideration of off-stream uses (Vadas and Weigmann 1993; Pacheco and Beecher 2010) that are minimal here. Unfortunately, instream-flow management has favored whitewater rafters over anglers in the West Branch (Vadas and Vadas 2005), which TU-National unwittingly facilitated by advocating for

relatively high flows throughout the landlocked salmon's range (Appendix 1). Periodic (e.g., weekend) cessation of hydropeaking operations can benefit lotic ecosystems (Poff and Schmidt 2016), albeit lower flows would now be better on weekdays (especially early in the week) when less whitewater rafters grace the West Branch (Vadas and Vadas 2005, pers. obs.).

Nevertheless, overly low flow flows from hydropower-caused flow fluctuations in the West Branch dewater productive side channels like that adjacent to Holbrook Pool (E. Spear, pers. comm. 2021), so better flow stability on daily and interannual time scales is important for long-term salmonid success (Vadas 2000, 2003; Vadas et al. 2008, 2016). Seasonally, there should be higher flows during the reproductive than rearing (growing) seasons for salmonids and other fishes (Vadas and Weigmann 1993; Vadas 2000, 2003; Annear et al. 2004). Notably, fishes need more flow stability than riparian trees (Vadas and Weigmann 1993; Vadas and Sanger 1993) and especially whitewater rafting, which perturbs the West Branch's hydrology away from normative (semi-natural) conditions that native biota are adapted to. Indeed, Trotsky and Gregory (1974) documented adverse effects of daily-fluctuating flows upon macroinvertebrate numbers, biomass, and species richness in another Maine river. Such hydrologic impacts, as well as thermal changes from dam operations and riparian deforestation, often impact aquatic-insect life histories to reduce important salmonid prey like immature/legged taxa (Barnes and Minshall 1983; Resh and Rosenberg 1984; Ford et al. 1995; Vadas 1997, 1998).

Another change in instream-flow management resulting from TU-National negotiations was putting more water into the bypass section directly below Ripogenus Dam (above the McKay Station powerhouse). Although this potentially improved the flow regime for salmon, the limnophilic, lower-flow needing brook trout (*Salvelinus fontinalis*) (Rupp 1954; Gibson 1978; Fausch 1988; Gibson and Cutting 1993; Ford et al. 1995; Bélanger and Rodríguez 2001, 2002; McGurren 2002; Deschênes and Rodríguez 2007) that formerly provided good fishing have likely declined given suboptimal flows (Vadas and Vadas 2005). And the formerly good salmon fishing there is compromised by warmer tailwaters, given changes in dam operations away from cold-hypoliminial releases from Chesuncook Lake (E. Spear, pers. comm. 2021). Hence, the only remaining good fishing for West Branch brook trout is (a) in groundwater-fed tributaries and (b) where they enter the mainstem (Vadas and Vadas 2005), similar to the Main Southwest Miramichi River where these char are also less mainstem-oriented than sea-run Atlantic salmon (Vadas 2002; FLAO 2021; cf. Rupp 1954; Gibson and Cutting 1993; Carpenter 2004). That is, the loss of spatial diversity in instream-flow regimes that TU-National negotiated (against my

caveats) has apparently reduced brook trout angling opportunities for this native West Branch species. Moreover, flow augmentation for whitewater rafters farther downstream (below McKay Station) has further reduced brook trout fishing success in the mainstem (Vadas and Vadas 2005). Other fish regularly caught there (especially near shore where it's slower) are fallfish minnows (*Semotilus corporalis*), which are too bony to be regular dinner fare (op. cit., pers. obs.).

In sum, the West Branch is no longer the great salmon fishery that it once was, likely given the combination of (a) dam-hydrologic changes for whitewater rafting, (b) more-conservative fishing regulations, and (c) cessation of stocking in more-recent decades (Table 1; Vadas and Vadas 2005). McGurren's (2002) overestimation of its salmon fishery may reflect his fishing-guide profession, proclivity towards angling farther downstream in the mainstem Penobscot River (McGurren 2015), and/or TU's interest in touting its role in the FERC negotiations, despite limited benefits for West Branch anglers unlike whitewater-rafting companies. Hence, a more-flexible approach to negotiations could allow better anglers success, for more-diversified recreational opportunities here. Indeed, the PHABSIM models used in the West Branch negotiations are meant to be used incrementally, to develop reasonable compromises for multiple-user benefits (Vadas and Weigmann 1993; Annear et al. 2004; Pacheco and Beecher 2010). This could help return the West Branch to the healthy ecosystem that it was when I was growing up. Clearly, further biophysical studies are needed for this effort, especially given increasing climate-change impacts on fish and wildlife in the USA (WMI and TRCP 2009; Hughes and Vadas 2021; Hughes et al. 2021).

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Table 1. Larger (but not maximum-sized) Atlantic salmon caught by family and friends in the Atlantic Northeast in recent vs. past decades, including for the West Branch of the Penobscot River (landlocked stock via non-winter fly-fishing and other angling methods [Vadas and Vadas 2005, pers. obs.]) and Main Southwest Miramichi River, NB (anadromous stock via vernal fly-fishing [Vadas 2002, pers. obs.]). Mass units are lb and (in parentheses) kg, with the help of Behnke's 1988) total-length (TL) vs. weight conversion factor (see the text). Time periods include 'old' (late 1960s to early 1970s), 'medium-old' (mid-1970s to early 1990s), and 'more-recent' (since the mid-1990s). During the medium-old time period, total length for harvest (a) increased from a minimum of 14" (~36 cm) to 18" (~46 cm) on the Penobscot and (b) was a constant maximum of 63 cm (i.e., ~41" for 'grilse') on the Miramichi (op. cit.). Penobscot bait-fishing was also greatly curtailed during this period (RLV, pers. obs.). Lack of fishing data is indicated by --.

| River | Old | Medium-old | More-recent |
|---|---|---|---|
| Penobscot | 4-5 (~2) | 3-4 (~1.5) | 1-2 (~0.75)[a] |
| Miramichi | -- | -- | $\leq$ 16 (~7.3)[b] |

[a]We have caught salmon up to 20-22" (51-56 cm) TL in recent decades here, but fish are typically under 18" (46 cm) long (RlV, pers. obs.; E. Spear, pers. comm. 2021).

[b]We have caught salmon up to 41" (104 cm) TL, albeit salmon up to at least 43" long and 30-40 lb (~14-18 kg) have been angled here (Vadas 2002, pers. obs.; FLAO 2021). Harvestable grilse, which spend only one year at sea, typically weigh 3-6 lb (~1.4-2.7 kg) in New Brunswick (Elson 1957; FLAO 2021).

Appendix 1. Scientific concerns about the advocacy of Trout Unlimited (TU-National) for fishery success and instream-flow management in the West Branch of the Penobscot River, ME.

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*"Eternal vigilance is the price of liberty." Thomas Jefferson*

Our response article (Vadas and Vadas 2005) to Pat McGurren (2002) – a fishing guide in the Penobscot River basin and member of TU's Georges River Chapter (McGurren 2015) – was faciliated by TU's Joe McGurren, who (unrelated to Pat) better advocated for our article than did the past editor of 'Trout'. Unfortunately, we were able to publish only a summary note, the full article appearing in the supposedly permanent 'Trout Magazine' blog that disappeared long ago from TU-National's website. We subsequently (in 2008) published the full article in the Olympia Chapter of TU's newsletter. I wonder how many other 'Trout' articles about salmon rivers, including those in the Pacific Northwest, have exaggerated the angling benefits? This emphasizes the importance of constructive peer review by multiple experts – including local sportsmen, game wardens, and biologists – for outdoors magazines like 'Trout', especially if that information is to have any scientific and management value (cf. Alessi and Miller 2012).

During my past consulting work for TU-National in 1993 (as a graduate student), I helped secure more fish-friendly flows for the West Branch. However, TU-National over-touted high flows, possibly to bankrupt the pulp-and-paper mill company (i.e., Great Northern Paper Company [GNPC]) that owned the dams then, rather than to achieve a "win-win" solution during the Federal Energy Regulatory Commission (FERC) relicensing process. This included veiled threats of landlocked Atlantic salmon perhaps getting federally listed, even though Endangered Species Act listing was subsequently reserved only for native, anadromous populations below natural barriers in Maine (Diaz-Soltero 1997; Musick et al. 2000; Klausmeyer 2002; Dudley et al. 2008). For these reasons, TU-National alienated itself from some of its Maine chapters, such that one Sunkaze Chapter member complained to me (years later) while fishing the lower, warmer Penobscot River where sunfishes are abundant (cf. McGurren 2015). The angler initially blamed me, so I explained that despite working as a TU-National consultant, I didn't necessarily agree with its hardline, "spoiler" tactics to join the FERC negotiation only in the "11$^{th}$ hour". More recently, I heard (through past TU leadership for Washington state) that I was branded as "not being a team player" for the West Branch negotiations, given my side discussions with the "other team" (GNPC) to find common ground (e.g., the

likely importance of rainbow smelt relative to cypriniform fishes in West Branch salmon diets). Hence, I wasn't allowed to speak to local-chapter members during an associated TU banquet in Maine during 1993. Nor did I secure further instream-flow or other paid work with TU-National (Vadas 2015). Later as a company consultant in Alberta, I saw and heard about unfair pressures from the industrial side, which often circumvented scientific concerns because "this is an important client" (op. cit.). Hence, both environmental and business interests often try to sway their consultants to say what they want to hear (op. cit.; Hughes et al. 2021).

As a result, I switched to government habitat-biology work, where the bottom line is not pleasing chief-executive officers (CEOs) or stakeholders. Scientific bias, however, does cloud agency negotiations for salmon (Lichatowich 1999; Montgomery 2003; Lackey 2015), other fresh- and saltwater fishes (Doubleday et al. 1997; Healey 1997; Hutchings et al. 1997a,b; Gunderson 2011; Vadas 2019) and wildlife (Aron et al. 2002; Orians et al. 2003), and terrestrial biota (Glick 2002; Karr 2006; Laskawy 2010; Alessi and Miller 2012; MICRA 2015; Zaffos 2015; Hughes et al. 2021). The same is true of academic research via "ego" battles (Vadas 1994a) and the dealings of the American Fisheries Society (AFS) and other environmental organizations that don't want to offend their financial supporters (Grossman 2015; Vadas 2015, 2019). Despite AFS' (2004) scientific support of dam breaching to recover North America fisheries, AFS-National subsequently voted down such advocacy for the lower Snake River (LSR), where four run-of-the-river, hydropower dams have (as predicted [Needham 1949]) greatly reduced salmon runs in this large Columbia River tributary, despite formerly important salmon runs and relatively undeveloped headwaters (Huntington et al. 1996; Lichatowich 1999; Nemeth and Kiefer 1999; Fraser and Kitzhaber 2002; WDAFS 2009). This likely reflects past agency biases for reservoir over stream fisheries (AFS 2015), although the Western Division of AFS (through its new Resource Policy & Environmental Concerns Committee) is reinvigorating its promotion of LSR-dam breaching for salmon and Southern Resident orca (killer) whale benefits (Vadas 2019, unpubl. MS). To adapt Thomas Jefferson's quote, "Eternal vigilance is the price of" doing natural-resources science and management.

October 9, 2021

Ms. Kimberly D. Bose
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

TROUT UNLIMITED
MAINE COUNCIL

**Via online submission to: http://www/ferc.gov (cross-filed)**

Subject: **Comments of Maine Council of Trout Unlimited on the Notices of Intent and Pre-application Documents for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458)**

Dear Secretary Bose:

On behalf of its six chapters and over 2,000 members, Maine Council of Trout Unlimited (TU) submits these comments on the Notices of Intent (NOI) and Pre-application Documents (PAD) for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) filed for Great Lakes Hydro America, LLC by Brookfield Renewable ("Brookfield" or "Applicant") dated June 11, 2021. TU submitted preliminary comments on September 16, 2021[1] asking for documents referenced in the PAD and 90 days after their receipt to conduct a meaningful PAD review in light of them. FERC rejected requests from NMFS,[2] USFWS,[3] MDIFW,[4] and MDMR[5] for information, documents and a 90-day delay, as well as a follow-up Scoping Meeting to better deal with stakeholder comments. TU subsequently requested documents be provided prior to the Study Plan Meeting in a second letter containing preliminary PAD comments.[6]

**Background**

Taken together, the Ripogenus and Penobscot Mills relicensings reflect over 108,000 kw of generation capacity making this the largest relicensing effort in the state of Maine in terms of electricity production by a large margin. The waters and surrounding habitat affected by these relicensings are of equal stature. The land-locked salmon fishery below Ripogenus Dam is sustained by naturally spawned fish and nationally known for its quality. With Maine's highest mountain nearby, Ripogenus Gorge below the dam is Maine's most spectacular gorge. The waters of the Penobscot Mills Project are also important in their own right and should play a part in the restoration of currently dewatered sections of the West Branch of the Penobscot River to provide traditional waterways and sustenance fisheries to the Penobscot Indian Nation (PIN) that have been so long promised but not delivered.

[1] Maine TU Council letter dated September 16, 2021, Subject: Comments of Maine Council of Trout Unlimited on the Notices of Intent and Pre-application Documents for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458).
[2] NOAA Fisheries letter RE: Extension of Time Request for the Ripogenus (FERC No. 2572-133) and Penobscot Mills (2458-247) Hydroelectric Projects dated September 13, 2021.
[3] USFWS Letter RE: Extension of Time Request for the Ripogenus (FERC No. 2572-133) and Penobscot Mills (2458-247) Hydroelectric Projects dated September 14, 2021.
[4] MDIFW letter RE: Extension of Time Request for the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458) dated September 17, 2021.
[5] Maine Department of Marine Resources letter RE: Extension of Time Request for the Ripogenus (FERC No. 2572-133) and Penobscot Mills (2458-247) Hydroelectric Projects of September 17, 2021.
[6] TU Letter dated October 2, 2021, Subject: Preliminary Comments of Maine Council of Trout Unlimited on the Notices of Intent and Pre-application Documents for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458)

Brookfield's submission places great stock in studies conducted many years ago during the last relicensing.[7] Brookfield Renewable, the entity that is responsible for PAD content, has only been in Maine as a corporate entity for about ten years. Brookfield is asking for the process to rely on prior studies that were NOT conducted by Brookfield - all Brookfield knows about them and the circumstances surrounding them is second or third hand information. The outcomes for the last relicensings of these projects were driven by the fact that then the electricity produced went directly to the mills in Millinocket. Any increase in the generation costs would have a potential effect on the economic viability of the mills, and decisions were made on the balance between the jobs and economics in local communities and the standards in state and federal environmental law. With the mills now closed and the electricity sold to the grid, that balance has fundamentally changed. In addition, environmental conditions and the operations of these projects have changed over the past 30 years. Climate change has been documented to have changed ice out dates and is suspected to have changed precipitation and river flows. Numerous stakeholder comments heard during the course of stakeholder meetings concerned apparent peaking activities associated with the operation of McKay Station. While the Penobscot Mills Project generation facilities are run of river operations, this appears to enable the operator to create a 'rolling peak' since the operator considerable flexibility to manage the water levels in the project's impoundments, and to control released from upstream storage at the Ripogenus Project and from upstream storage reservoirs.

Besides the apparent change in project operations, climate change must be considered. Most of the last five years have been relatively dry ones. Lake levels in the Ripogenus-Chesuncook reservoir appear to be historically low as supported by numerous stakeholder comments to that effect, and this may be due to climate change. Stakeholders continue to report that it has been years since the impoundment has been at any level resembling full pond based on vegetation on the margins. It is an open question whether this reflects a change to project operations, climate change, or both. Rather than rely on anecdotes or assurances, new study data is essential.

With this as a backdrop, it is inappropriate for the Applicant to rely so heavily on summaries of 30-rear-old studies described in past license applications. Doing a word search of the PAD Volume 1, Part 1 on "GNNC 1991a" and "GNNC 1991b", the prior license applications, yields 81 and 74 occurrences respectively. The FERC process exists to review the status of projects every 30 to 50 years because both environmental conditions and the balance between project impacts and benefits are subject to change as is undeniably the case with the Ripogenus and Penobscot Mills projects. Small projects of 10 megawatts or less can be designated as exempt from this process and issued FERC Exemptions**. This is not a FERC-exempt project whose operating conditions continue in perpetuity.** The National Environmental Policy Act (NEPA) requires a "Well Considered" and "Fully Informed" study.[8] If we are to accept past data and past studies, stakeholders should know exactly what we are accepting and not have to rely on summaries provided by the applicant. Only then will resource protection agencies and stakeholders be able to generate appropriate FERC study requests. It must also be noted that most of the referenced studies are older than the 10 years specified for studies by the courts in American Rivers III.[9] The commission appears to be ignoring this; indeed the Commission's response to the Penobscot

[7] Brookfield Notices of Intent and Pre-application Documents for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) dated June 11, 2021, page 1-11. "*GLHA maintains that a full suite of new studies is not needed, that the vast body of information on which today's certifications and licenses are soundly based and should be relied upon for these relicensings. In addition, consistent with the Commission's criteria for study requests, the scope and extent of any new study be focused on addressing specific data gaps necessary to inform the development of license requirements.*"

[8] Implementation of the National Environmental Policy Act (NEPA) of 1969. Federal Register / Vol. 73, No. 200 / Wednesday, October 15, 2008 / Rules and Regulations 61299.

[9] American Rivers and Alabama Rivers Alliance v. FERC and United States Secretary of the Interior, No. 16-1195 (D.C. Cir. 2018) ("American Rivers III").

Indian Nation (PIN) request for the Commission to explain how its policies have changed as a result of American Rivers III was to refuse to discuss impact of the decision.[10] We hope that the Commission will reconsider the implications of American Rivers III and apply them going forward.

The applicant proposes a minimal and inadequate list of studies.[11] These appear near the end of Volume 1, Part 1. We will comment on these later in this document in the last portion of the Specific Comments section and these comments will form the most important part of this filing. Please bear with us as we provide comments for the record to address the content the Applicant has provided concerning the proposed studies. Emphasis is provided for clarity due to the high number of specific comments.

**General Comments**

1. Language

The Applicant uses language to minimize the impacts of its projects that dewater significant segments of the main stem of the West Branch of the Penobscot River in two areas:

> "bypassed reach" to described the section of the mainstem of the West Branch of the Penobscot River below Ripogenus Dam that is watered by leakage flows for nine months out of the year. "Dewatered section of the West Branch Penobscot River in upper Ripogenus Gorge" is a more accurate and descriptive term that should be used in project documentation going forward.
>
> "Back Channel" is used extensively to describe the main stem channel of the West Branch of the Penobscot River below Stone Dam that is only watered with leakage flows of 2 - 5 cfs during the summer months of most years. This is NOT a back channel. "Dewatered mainstem of the West Branch of the Penobscot below Stone Dam" is a more accurate and descriptive term that should be used going forward.

In the interest of brevity, we will not cite each instance of these.

**Specific Comments**

1. Title page (unnumbered). At bottom of the page (and over 400 subsequent ones) this notation appears: "*Copyright © 2021, Great Lakes Hydro America, LLC. All rights reserved."* The FERC process is a public one that actively seeks comments from the public. While these notations were appropriate to the documents before they were filed to the FERC dockets, once they were posted, the document became part of the public domain. Accordingly, the notation became incorrect the moment the document was filed. Including it can only serve to confuse those unfamiliar with the process, and discourage use of the filing in the media. The notation should NOT be included in future filings for these relicensings.
2. Page 1-5. Paragraph at top of page omits the fact that the construction of McKay Station rerouted the main flow of the West Branch of the Penobscot River through the water tunnel generally dewatering Ripogenus Gorge upstream of the powerhouse except for leakage flows and during high flow periods when the flow capacity of the powerhouse is exceeded.
3. Page 1-10. " *Establishment of 2,300 acres of land surrounding the Back Channel as a Wildlife Management Area and implementation and maintenance of various measures for the*

[10] FERC Letter dated September 28. Reference: Response to Extension of Time and Additional Public Meeting Requests, and Request for Information for the Ripogenus Project No. 2572-133 and the Penobscot Mills Project No. 2458-247, page 2.
[11] PAD page 6-81 and subsequent.

*enhancement of wildlife habitat in the area*." This remediation measure tacitly acknowledged the environmental damage caused by dewatering the main stem of the West Branch of the Penobscot River. While the remediation was better than nothing, it failed to address the direct harms caused by seasonal dewatering including loss of the structure and function of that reach of the main stem of the West Branch of the Penobscot River and denies the PIN with the means of accessing their traditional waterways during the summer.

4. Page 1-11: *"GLHA maintains that a full suite of new studies is not needed, that the vast body of information on which today's certifications and licenses are soundly based and should be relied upon for these relicensings. In addition, consistent with the Commission's criteria for study requests, the scope and extent of any new study be focused on addressing specific data gaps necessary to inform the development of license requirements."* TU strongly disagrees with this. Changes in operations due to changes in ownership, climate change and other changes that have occurred over the last thirty years must be considered.

5. Page 1-11 and12: "*Based on the totality of studies conducted, settlement agreements reached, PM&E measures incorporated, and water quality certifications issued, FERC's 1996 licenses concluded that the Projects are best adapted to serve the public interest. GLHA maintains that nothing has significantly changed that would alter this conclusion. If anything, the fight against climate change as well as socioeconomic challenges to the region only amply the importance of ensuring that these relicensing proceedings do not result in a reduction of the Projects' ability to produce clean, renewable energy."* **While the PM&E measures MAY have reflected the public interest at that time, this is not necessarily the case today.** Much has changed since 1996: changes in the local economy and community; changes in the use of the electricity produced; changes in the way the project is operated; and potential changes in both the other uses of the resources of the West Branch Penobscot River and in its biological communities. FERC licenses are not permanent and need to be renewed for a reason: to accommodate changes with a periodic re-examination of each project.

6. Page 1-12. "*GLHA's overall approach and overarching interest in these relicensings centers on: Maintaining the sound balance between power and non-power values that exists today as achieved through the extensive proceeding that resulted in the Projects' existing licenses;"* The FERC **re**licensing process exists to ensure that the sound balance is periodically re-assessed, and, as appropriate, adjusted.

7. Page 1-12, the paragraph continues: "*Preserving the Projects' renewable energy and capacity provided to the local electrical grid, as well as preserving the economic viability and significant investments made by GLHA over the terms of the Projects' existing licenses; and:* need for power on the grid is declining as other renewable sources such as solar and wind continue to be developed.

8. Page 1-12, The last item in the paragraph: "*Recognizing and leveraging the collective value of the Projects' existing PM&E measures, environmental monitoring activities over the terms of the Projects' licenses, and associated body of existing information as a legitimate basis for decision-making."* While the existing PM&E measures are significant, they need to be revisited as part of the relicensing process. Clear examples: Since the mills closed, the population of the Millinocket area has decreased significantly; the local demographic has changed and so should be their needs relating to use of the resource. Whitewater is a recognized recreational use, and kayaking is now a significant art of that; kayaking has greatly increased over the last thirty years.

9. Page 1-112. The applicant describes the projects as "*carbon-free energy.*" This is simply NOT the fact due to methane gas production by impoundments described in a growing body of scientific literature.[12] **While the carbon profile is much less than fossil fuels, the Applicant's claim of *"carbon-free energy"* is incorrect as stated, and this is repeated elsewhere in the PAD without supporting study data.**

10. Page 1-113. The second paragraph discusses the need for flexibility that hydro provides. Brookfield has constructed two battery storage facilities at the projects[13] to provide additional flexibility. Battery storage is a mature technology that solar and wind generation facilities can also use this same technology to meet peak demands. While the flexibility described is desirable and was formerly a major advantage to hydro technology, mature battery storage technology is a means of replacing that flexibility. It is a good option to peaking projects that can have serious effects, especially on the littoral zones of impoundments. Battery storage gives the operator a more environmentally friendly option. When asked if the two battery storage facilities has constructed for the Ripogenus and Penobscot Mills Projects were going to be used for this purpose, the Applicant's response was "no."

*11.* Page 1-114. "*If the existing flexibility, operational ranges, or peaking capabilities of the Projects as presently licensed were further limited or curtailed, the ISONE would need to rely more heavily on natural gas burning facilities to meet peak power demands now and into the foreseeable future.* **The Applicant describes a lack of flexibility with the projects, and fears of them being "*further limited*." This is simply not the case. The Ripogenus-Chesuncook reservoir can be drawn down as far as the mechanisms of Ripogenus Dam allow (44 feet), the interconnected reservoirs of the Penobscot Mills projects have minimum restrictions on water levels, provision for pumped storage, and minimal reporting requirements. The Applicant's recent installation of two battery storage facilities to support the projects provides even greater flexibility.**

12. Page 1-114. The Applicant describes flow management within the greater Ripogenus-Penobscot Mills system. The upper West Branch is a highly altered system and is likely to remain so for this relicensing cycle and beyond. The task is to manage it intelligently and effectively so as to balance project benefits and harms. The FERC relicensing process exists to provide periodic re-examination of flows and other aspects of project operations. **Data to enable effective analysis of flows is the key information requirement for relicensing of both the Ripogenus and Penobscot Mills projects. I**t should also be noted that the flows and water temperatures at both projects are extremely complex. At Ripogenus Dam, water may travel downstream through the water tunnel, over the dam, through the deep gate or over the sluiceway; at Penobscot Mills, the complexity of the multiple impoundments and generation facilities drive the difficulty. These factors will need to be considered in studies.

13. Page 4-11 and subsequent. Section 4 describes existing project facilities. **Nowhere in the PAD does it describe how operations are monitored and controlled. Both project operations are controlled remotely from Brookfield's control center in Marlborough, Massachusetts.** When asked at the morning Scoping Teleconference on September 9 how many other facilities were controlled from that location, Brookfield did not give a number. When asked where

[12] Environ. Sci. Technol. 2013, 47, 15, 8130–8137, Sediment Trapping by Dams Creates Methane Emission Hot Spots, accessed at https://pubs.acs.org/doi/full/10.1021/es4003907; Nature Communications volume 10, Article number: 1375 (2019) Eutrophication will increase methane emissions from lakes and impoundments during the 21st century accessed at https://www.nature.com/articles/s41467-019-09100-5; and others.

[13] PAD, page 4-16.

maintenance crews were located to address problems at McKay Station, Brookfield responded that is was in Millinocket about an hour away. Section 4 also does NOT contain a description of how emergency flow are maintained during times of generating unit outage. This is significant because there were three recent low flow events below Ripogenus Dam within a three-week period.[14] Minimum time to correct generator outage problems appears to be over two hours. The remote control of project operations and distance from the project of response crews to Ripogenus Dam and McKay Station underlines the importance of obtaining operational data for the projects. If FERC's investigation into the cause of these outages does not reveal their source, then a FERC Study should look into how operations for the projects are being controlled.

14. Page 4-13. The description should also include that the impoundment created by Ripogenus Dam is Maine's third largest.

15. Page 4-24 and subsequent do NOT mention the dewatering (other than leakage) of 4.5 miles of the main stem of the West Branch of the Penobscot below Stone Dam.

16. Page 4-44. Ambajejus Lake needs to be added to the graphic. Although referred to repeatedly in the subsequent description, it only appears in the legend of figure 4.4-1.

17. Page 4-50. Note that Millinocket Lake levels can vary between 470 and 480 feet. Data is needed to verify that this is occurring.

18. Page 4-52. The tables provided show average monthly flows for the projects. This is of little use in determining how flows vary on time scales ranging from instantaneous to daily to weekly to between years, and do not indicate the frequency and magnitude of flow excursions that differ from these averages.

**19.** Page 4-54, Article 54. Status states: "*GLHA continues to provide the required minimum flows via leakage and the sluice gates.*" **The sluice gate flows were designed to provide 100 cfs "fishing flows" from July 1 to September 30 to the significantly dewatered reach of the main stem of the West Branch of the Penobscot that makeup fully half of the waters in Ripogenus Gorge. During the last relicensing, use of water from the sluice gates was requested by Great Northern Paper and specified. The sluice gates provide warm water from the surface of the impoundment.[15] The benefits to the fishery would be greater if deep gate releases of colder water were used.**

20. Page 5-44. Does NOT describe the dewatering of the main stem of the West Branch of the Penobscot River below Stone Dam.

21. Page 5-57. Discusses the Use Attainability Analysis (UAA) for the Ripogenus impoundment, and 38 MRS §464-9(A), noting: "*The project creates an impoundment that is subject to water level fluctuations that have an effect on the habitat and aquatic life in the littoral zone so that the habitat and aquatic life differ significantly from that found in an unimpounded great*

[14] TU letter Subject: Maine Council of Trout Unlimited Report of Observed Low Flow Events for the Ripogenus Project (P-2572) dated September 21,2021. FERC created sub-docket P-2572-134 to track correspondence relating to this.
[15] Paul Johnson (former MDIFW fisheries biologist eComment of October 8, 2021: "Flows in the Upper Gorge between Ripogenus Dam and McKay Station have not met the objectives for this section of river for the past 25 years! Article 401 of the current license requires a July 1 - September 30 discharge of 100 cfs into the Upper Gorge to provide a cool flow that would attract adult salmon and increase fishing opportunity in the gorge during this period. The recommendation for this flow and its timing was based on observations in years prior to the 1990's, when minimum flows discharged to the West Branch with McKay Station shut down were provided through a deep gate in Ripogenus Dam – hence the cool water. Unfortunately, for the past 25 years the 3-month discharge has been through a small sluice gate that provides warm, surface water to the Upper Gorge, defeating the purpose of Article 401 – 25 years of lost mitigation/enhancement."

*pond;*" Current fluctuations in water levels need to be determined and compared to those upon which the UAA was based.

**22.** Pages 5-87 and 88. **MDEP benthic macroinvertebrates monitoring was NOT conducted in the main stem of the West Branch of the Penobscot River below Stone Dam. Current MDEP protocols call for sampling in bypass reaches.**

23. Page 5-94. "*Both the Ripogenus and Penobscot Mills Projects are within the native range of the brook trout. The brook trout (Salvelinus fontinalis) fishery in the West Branch declined during the 1950s as the landlocked salmon fishery increased in popularity (FERC 1996).*" **Brook trout are found in every county in Maine, co-exist with landlocked salmon throughout the range of landlocked salmon in Maine and are frequently sought and caught by West Branch Penobscot anglers.** Subsequent paragraphs reference two studies requested but not provided: FishBase 2021c and FERC 1996.[16] This underlines the need for referenced studies to be provided, NOT summarized.

24. Page 5-104 and subsequent. IBI (Index of Biological Integrity) is referred to as a source for fish assemblage data. This is another document referenced in the PAD and not provided. IBI for the Penobscot Mills Project reaches likely show serious damage to the biological health of the reaches. This is another reason why data summarized by the Applicant is inadequate.

25. Page 5-108. Center of page: "*…gill netting efforts. Fish species collected during boat electrofishing surveys in littoral habitats included predominantly white sucker and white perch (GNNC 1991a)*." These data are 30 years old, and there are multiple reasons to believe that species composition may have changed during this period: (1) Maine has seen an enormous increase in the spread of non-native fish species as a result of deliberate illegal introductions; incidental introductions due to use of live bait; and migration from existing established populations. (2) Climate change may very well have altered habitat suitability for some sensitive species. (3) Project operations may have change the magnitude or duration of reservoir drawdowns that limit the amount littoral habitat and oxygenated deep water available in the impoundment. Anecdotal reports indicate that the reservoir has not been fully filled since 2019. Any assessment of the projects impacts and appropriate future operation must start with an understanding of today's baseline fish populations.

**26.** Page 5-108. Following paragraph: *"Non-native species such as northern pike and smallmouth bass have not been documented in the Ripogenus Project area, although they have been documented in more downstream reaches of the Penobscot River Basin. There are no anadromous fish populations present in the Ripogenus Project area. A fish species list is provided in Table 5.4-4."* **Table 5.4-4 contains historical data. Table 5.4-6 on page 5-118 contains data from 1986-1989 Fish Assemblage Surveys. Invasive species continue to be spread throughout the state. The only way to know whether these species are present is to conduct fish assemblage studies.**

**27.** Page 5-110: ""*During the previous relicensing effort, the Licensee proposed to provide stable minimum flows from McKay Station into the West Branch to promote landlocked salmon spawning and egg incubation. As such, pursuant to License Article 402, GLHA provides landlocked salmon spawning flows of at least 1,422 cfs (or inflow, but not less than 1,300 cfs) from October 15 to November 15 and incubation flows greater than 1,422 cfs (or the spawning flow established for that year) from November 16 through June 7. These flows were developed to prevent exposure and desiccation of salmon redds and enhance overall*

[16] TU Letter dated October 2, 2021.

*reproductive success (FERC 1996). Further, GLHA implements automatic, short-term "outage" flows of 400 cfs downstream of McKay Station during station outages as a temporary means for protecting aquatic habitat in downstream reaches of the West Branch. Stable flows resulting from water management at McKay Station help to maintain constant, high quality flow conditions downstream."* **That "*stable flows*" are being provided remains a matter in question. Three low flow events were documented during a three-week period by TU in 2021.[17]**

28. Page 5-117: "*…higher flows (50 to 100 cfs) were shown to improve habitat for landlocked salmon.*" **Higher flows would also provide a buffering mechanism for the low flow events that we have repeatedly referred to.**

29. Page 5-120: "*There are recent reports that smallmouth bass have become illegally introduced to the impoundment (Kevin Dunham, MDIFW, personal communication, May 2021)."* This statement refers to Table 5.4-7, Fish Assemblage Data from North Twin Impoundment (2016-2017) which does NOT list smallmouth bass. **It is incongruous for the Applicant to urge the Commission to accept 30-year-old data when this shows that even four-year-old data may be outdated.**

30. Page 5-125 and 126: Referring to the waters of Lower Millinocket Stream and West Branch (Millinocket Tailrace to Dolby Pond): "*This reach of river only supports warmwater species (GNNC 1991b).*" This includes the dewatered reach of the West Branch of the Penobscot River. Since the Great Falls occurs downstream near the confluence with Shad Pond, one would expect for this reach to support at least a mixed cold water and warm water fish assemblage due to increased oxygenation if the reach were not dewatered. This is more evidence of how disruptive project operations are to the fisheries environment.

31. Page 5-128: Table 5.4-11 Fish Assemblage Data from 2004 IBI Sampling in Millinocket Stream. This reach is accessible from Shad Pond. **American shad were not sampled. There are no shad in Shad Pond due to the presence of downstream dams and the lack of effective fish passage.**

32. Page 5-129: "*The Back Channel is a 4.5-mile-long reach downstream of Stone Dam (Millinocket impoundment) that flows into Shad Pond. The Back Channel is bracketed by Stone Dam and Grand Falls, which is a natural falls located approximately 2.7 miles below Stone Dam and a barrier to upstream movement of warmwater species, sea run alosines (shad and river herring), and juvenile salmon (GNNC 1991b) (Photo 5.4-2). The reach receives inflow from various tributaries as well as from Quakish Lake, which in the summer is composed of warm limnetic surface water spill at Stone Dam.*" The warm water input that is described (when present) contributes to the lack of salmonids. See specific comment 30 above. Also note that **no specific fish assemblage is provided for the mostly dewatered section. This section is NOT 'fishable or swimmable' as required by the Clean Water Act.**

33. Page 5-132: *"Changes in macroinvertebrate composition are related to distance downstream from the Ripogenus Dam, likely due to a diminishing supply of plankton and other particulate material in water discharged from McKay Station."* TU members have observed so many stoneflies flying out of the gorge below McKay Station that they were being caught on the wing and eaten by flocks of seagulls. The watered section of Ripogenus Gorge is one of the most productive stretches in Maine waters in terms of macro-invertebrate production, and this is a major factor in maintaining the remarkable land-locked salmon fishery below McKay

[17] TU letter dated September 21,2021.

Station. **Dewatering the gorge above the powerhouse, about half the total length of the gorge, except for leakage flows for three months out of the year and only 100 cfs through the sluiceway for the summer months greatly decreases potential macro-invertebrate production. Instream Flow Incremental Methodology (IFIM) studies may show that there is some suitable for landlocked salmon at different stages of development, but ignore profound project effects on potential macro-invertebrate populations.**

34. Page 5-169: Third bullet point does NOT describe any of the effects of the dewatering of the main stem of the West Branch of the Penobscot River below Stone Dam. One would expect that significant effects have occurred as a result of the perennial dewatering since 1996, and the vegetation present seem to support this. The current condition needs to be assessed by formal studies to evaluate water quality and appropriate flows.

35. Page 5-206: Table 5.8-1 lists only Formal FERC-Approved Project Recreation Sites for the Ripogenus Project. Many more recreation sites exist that are affected by project operations. These include drift boat pullouts, formal campgrounds, parking pulloffs, etc.

**36.** Page 5-247: *"The Upper Gorge itself is very scenic with stretches containing sheer vertical walls that rise 75 feet above the riverbed."* This is true as stated, but **the description omits the fact that except for high flow conditions, the upper gorge is only watered with leakage flows for nine months out of the year, 100cfs during the summer months. This significantly diminishes the aesthetic qualities of the gorge.** While TU's interests lie primarily with the fishery, the aesthetics of the area are a factor in our members' use and enjoyment of the area.

**37.** Page 5-252 and subsequent: This describes the historical context of the projects. It should be noted that **a significant part of the original justification for damming Ripogenus Gorge was to provide electricity to power the trains that hauled the logs from the region, replacing coal.[18] Fossil fuel continues to be the prime mover of cordage from the region.**

38. Page 6-3, Water Quality – Upper Gorge: Water quality of the Upper Gorge (half of the gorge is above McKay Station) needs to be revisited during this relicensing cycle. 100 CFS fishing flows during the summer originally was for a deep gate release instead of the sluiceway. Water source affects temperature and dissolved oxygenation levels. 12 cfs leakage flows do NOT provide "structure and function" as required by current Maine environmental law and policy. Past IFIM studies looked only at land-locked salmon at certain stages of development and ignored effects on macro-invertebrate populations, a main factor in the abundant fishery. MDEP studies to gather this information are supported by TU.

**39.** Page 6-4, Water Quality - Impoundment Aquatic Life: The **Applicant states that there is no change in operations or effects on aquatic life. Reports to the contrary and effects to the fishery say otherwise.** This statement is simply unsupported by current data. The applicant has not provided operational data demonstrating that operations have not changed; the applicant has not provided aquatic life data that show that the aquatic community has not changed.

40. Page 6-4, Baseline Fisheries - West Branch (below McKay Station): "*Significant amounts of information/data on West Branch fisheries already exist, as fisheries data were collected during the last relicensing and has continued to be collected by the GLHA and MDIFW. The existing fisheries data are sufficient to characterize the existing West Branch fishery. As there*

[18] West Branch Water May Move Maine Railroad Trains; Bangor Daily News, Friday, December 8, 1916; page 14. "Million Dollar Barrier at Ripogenus Gorge That Will Change the Face of Nature BY Flooding Seven Lakes Into One…"

*have been no changes to Project operations, there are no expected changes or impacts to West Branch fisheries."* There simply is no way to assess the effects of project operations without current operational information.

**41.** Page 6-12, Penobscot Mills - Back Channel Instream Flows: This reach is **the largely dewatered West Branch of the Penobscot. It does NOT maintain the structure and function required by Maine environmental law. That the reach only supports warm water species [19] despite how far north demonstrates the degree to which it is degraded by lack of instream flow.**

**The following specific comments deal with the Applicant's list of potential studies:**

42. Page 6-19, Water Quality Study - Ripogenus: The applicant lists the suite of studies normally required by MDEP.

**43.** Page 6-19, **Macroinvertebrate Survey - Ripogenus: The applicant proposes only one macro-invertebrate study downstream of McKay Station. Current MDEP protocols require sampling "*in any bypassed region created by the project.*"[20] This is essential to assess the effects of reduced flows in the upper Ripogenus Gorge.**

44. Page 6-19, Recreation Facility Inventory and Condition Assessment. Past studies conducted by Brookfield have been quite selective in what was included. The second bullet: "Desktop research and inventory of regional recreational facilities, opportunities, and management plans." is inadequate and of minimal utility in this rural setting. "The third bullet: "I*dentify gaps, improvements, or use needs within the Project boundary*." simply cannot be accomplished using this minimal methodology. Interviews, and focus groups are absolutely required to assess current recreational requirements for the project area and vicinity, both of which are highly affected by project operations. A recreational inventory will ignore many recreational amenities that Mainers have enjoyed for many years as well as the aesthetics involved with the project. **Well established methodology exists to conduct a study appropriate to the projects: Flows and Recreation, A guide to studies for river professionals; Doug Whittaker, Ph.D, Confluence Research and Consulting; Bo Shelby, Ph.D., Oregon State University; John Gangemi, American Whitewater / OASIS Environmental; October 2005.** Please note that this now standard methodology was NOT published until after the last relicensing.

45. Page 6-20, Macroinvertebrate Survey: **No macro-invertebrate survey is proposed for the main stem of the West Branch below Stone Dam.** This omission runs contrary to MDEP protocol.[21] Failure to conduct such a study will result in a deficient Environmental Assessment (EA). Comparing macro-invertebrate populations below Stone Dam, the main stem of the West Branch of the Penobscot River with those of Millinocket Stream where the vast majority of flows are currently directed will highlight how profound the continuing project impacts are.

**Conclusions and Recommendations**

The Applicant is proposing to treat the relicensings of these projects as if the fact that the last relicensings were conducted after the passage of the Electric Consumers Protection Act of 1986 absolves the Applicant from the responsibility to fulfill the requirements of the Integrated Licensing Process (ILP).

[19] PAD, page 5-126, Table 5.4-10. No salmonids are listed.
[20] DEP Sampling Protocol For Hydropower Studies dated December 2017.
[21] Ibid.

This is not a FERC-exempt project whose operating conditions continue in perpetuity. It is a licensed project where operations, benefits, and impact are re-evaluated periodically through the re-licensing process. Failure to conduct studies needed for FERC to identify project harms and balance them with project benefits would be contrary to public law, policy and practice. NEPA requires the studies be "Well Considered" and "Fully Informed." Thirty-year-old studies can be neither.

The Applicant's contention that data collected, studies accomplished and MP&E measures adopted are sufficient for submission for this relicensing is unsupported. Much has changed in the intervening years. This includes changes in: management through a succession of three owners, recreational use of the resource - even the climate itself. Only through analysis of data by collected by dedicated study will show if there have been effects, and (if there have been) suggest adaptive measures to address them.

Anyone who has spent time in the region from west of Millinocket to the Ripogenus-Chesuncook impoundment is quite aware that the impoundment has been perennially dewatered, that sections of the main stem of the West Branch of the Penobscot River are largely dewatered both below McKay Station and Stone Dam. Comments verbalized at the Scoping Meetings and written since then leave little doubt that this is what is occurring; the Applicant's submission attempts to minimize or ignore them.

**The PAD says very little about flow studies, and these are most important.** Numerous stakeholders have stated that project operations have changed, and you would expect this to be the case when there have been three owners since the last relicensing, and when the purpose of the dams has changed from providing power to working paper mills who owned them to producing power to sell on the grid. Climate change, including increasingly dry summers, is a factor as well. The relicensing process is the only opportunity to assess these changes and determine whether changing conditions alter the projects' benefits and impacts, and suggest changes in operations.

The Commission has NOT answered the requests of four resource protection agencies, PIN and TU for 10 years of operational data, most recently reiterated by e-mail from the National Marine Fisheries Service on October 5, 2021:

> *"Mr. Creamer - Your September 28, 2021 Response to Extension of Time and Additional Public Meeting Requests, and Request for Information for the Ripogenus Project No. 2572-133 and the Penobscot Mills Project No. 2458-247 did not address our September 13, 2012 request for operations data for these projects. Specifically, NMFS requested:*
>
> *We also request that you require the Applicant provide us with 10 years of operations data for each project including: 1) daily impoundment elevations; 2) daily outflows for each project (minimum, maximum, and average daily discharge). These data are critical for us to develop comments on the PAD and identify data gaps and any new studies.*
>
> *Can you please update us concerning the status of this request?*
>
> *Thank you, Jeff Murphy."*

Even if the information were to have been provided immediately, it would leave the agencies without adequate time to conduct meaningful analysis of the data.

Repeated observations that there are changes to prevailing lake levels in the Ripogenus-Chesuncook impoundment should be assessed with operational data. If operations and/or natural hydrology have changed since the 1996 license, the analysis and assumptions that informed 1996 licenses, 401 certificates, and the Use Attainability Analysis must be re-examined. Conditions are so poor that smelt populations have likely suffered and must be reexamined by scientific study.

TU sees the following as studies as absolutely essential to the preparation of an EA for the projects:

1. For the Ripogenus Project:

a. Studies of aquatic life in the Ripogenus-Chesuncook impoundment to determine if species populations have changed since the last relicensing.

While 38 MRS §464-9(A) allows changes to the littoral zone, the extreme conditions described by multiple comments indicate that the limnetic and profundal zones may be seriously impacted as well.

b. Flow Studies for the Ripogenus Dam for both above and below McKay Station

There have been three different owners since the last relicensing: Great Northern Paper, and Great Lakes Hydro both before and after its purchase by Brookfield. These questions need to be answered: Has the McKay Station been operated differently during the ownership periods, is the perceived peaking operation actually occurring, are perceptions all due to climate change?

c. Temperature studies below both above and below McKay Station

The dam facilities are complex and care must be taken to ensure that water tunnel, over the dam, deep gate and over the dam scenarios are considered as well as the inter-relationships between sources as water from the different sources will have different temperatures and this will vary dependent on time of the year.

d. Macro-invertebrate and DO studies for both above and below McKay Station with comparisons of the two different reaches.
e. A proper Recreational Study to replace the perfunctory Recreational Facilities Inventory that the Applicant has proposed.
f. Detailed analysis of the outflows of McKay Station to determine the cause, frequency, magnitude and duration of the low flow events below Ripogenus Dam.

This study should consist of analyzing operational data against the flow requirements detailed in the PAD.[22] This analysis can be accomplished by testing Brookfield's operational data against minimum flow requirements, something readily accomplished by computer algorithm.

g. A study revisiting the adequacy of 400 cfs as a flow adequate to prevent stranding and dewatering of salmonid redds during generator outage.
h. If warranted by study f above, an engineering study to determine means to improve the stability of the flows from McKay Station.

2. For the Penobscot Mills Project:
   a. Flow Studies for the West Branch of the Penobscot River for both Millinocket Stream and the waters below Stone Dam.
   b. Temperature studies for both Millinocket Stream and the waters below Stone Dam.
   c. Macro-invertebrate and DO studies for both Millinocket Stream and the waters below Stone Dam.
   d. A proper Recreational Study to replace the perfunctory Recreational Facilities Inventory that the Applicant has proposed.

Accordingly, TU supports the study requests of:

1. MDIFW[23] for these proposed studies that bear directly on their ability to manage resident species:

   1) Exposed Aquatic Habitat Assessment

   2) Landlocked Salmon Habitat Use/Spawning Study—Penobscot Mills Project

[22] PAD, page 4-45, Minimum Flow Requirements downstream of McKay Station for the Ripogenus Project.
[23] MDIFW letter dated October 8, 2021.

3) Minimum Flow Analysis of Back Channel [West Branch below Stone Dam]

4) Macroinvertebrates Study Request—Ripogenus Project

2. NMFS[24] for these key flow-related studies. While these studies are fully justified on the basis of effects on Atlantic salmon, the information would be invaluable for determining the effects of flows on resident fish species and other aquatic organisms as well:

1) A Study to Evaluate the Effects of Operating the Penobscot Mills and Ripogenus Dams on the Hydrology of the West Branch and Mainstem Penobscot River Using an Indicators of Hydrologic Alteration Model (IHA)

2) A Study to Evaluate Project Effects on River Temperature in the West Branch and Mainstem Penobscot River

3) A Study to Evaluate Future Flow and Water Temperature Scenarios[25]

3. MDMR[26] for studies for American eels and passage alternatives for all historic anadromous species:

1) Three-Dimensional Computational Fluid Dynamics (CFD) Modeling Upstream and Downstream of the Discharge and in the Vicinity of Powerhouse Forebays

2) Upstream Juvenile Eel Assessment

3) Downstream American Eel Passage Assessment

4) Downstream Passage Alternatives Study

5) Upstream Passage Alternatives Study

6) Evaluation of the Size of American Eels and the Timing of their Downstream Migratory Movements

4. USFWS[27] for the following due to their potential positive impact on the ecology of the entire Penobscot Watershed:

1) Upstream American Eel Passage Assessment

2) Downstream American Eel Passage Assessment

3) Downstream Passage Alternatives Study [eels]

4) Evaluation of the Size of American Eels and the Timing of their Downstream Migratory Movements

5) Freshwater Mussel Survey

5. American River and the Appalachian Mountain Club[28] for the following: aesthetics and other uses are also important to TU members. The first study is absolutely essential to identify changes that have occurred since the last license was issued and to identify needs for the next licensing period. Whitewater flows have proven to be highly compatible with fishing-related activities on the West Branch. Care must be taken to assure that commensurate minimum flows are adopted to prevent the stranding of aquatic organisms following cessation of these flows:

[24] NMFS letter dated October 8, 2021
[25] TU believes this is the key study for the Rigogenus - Penobscot Mills relicensings
[26] MDMR letter dated October 8, 2021.
[27] USFWS letter dated October 7, 2021.
[28] Joint American River and the Appalachian Mountain Club letter dated October 8, 2021.

1) Recreation Facility Inventory, Recreation Use and Needs Assessment, Aesthetics and Reservoir Surface Area Assessment Study

2) Controlled-flow Whitewater Boating and Access Study

3) Aesthetics Resources Study

6. The standard MDEP suite of study requests conditioned to provide sampling in the generally dewatered reaches of the main stem of the West Branch of the Penobscot River in upper Ripogenus Gorge and below Stone Dam. While the specific legislation[29] allows major changes to the littoral zone, with the severe changes to impoundment levels that have been extensively documented by numerous photographs and comments, the limnetic and profundal zones have likely been impacted as well. Study is indicated, and this does not represent a conflict with the statutory language

TU submits the following Requests for Information (RFIs):

1. That Brookfield clarify ownership by itself or any of its partners of the parcel containing the stream bed of the West Branch of the Penobscot and the margins thereof as shown in Attachment A[30] as this may affect the status of recreational access downstream of Ripogenus Dam.
2. Trout Unlimited reiterates its request for the specific referenced studies that we requested, so that we may understand the existing information and likely draft additional study requests. (Attachment B). TU additionally requests that FERC criteria for additional studies be applied more permissively than is generally the case to any requests that the agencies, PIN or NGO may submit later in the process if/when important information is still lacking.
3. Thirty years of operational data for all generation facilities. This is over and above agency requests in order to enable a comparison of operations among the three corporate entities that have owned and operated the Ripogenus Project during that time frame. That this data exists for at least some of this timeframe is illustrated by the graphic included as Attachment C, Figure 1. TU requests that generation data for all generation facilities be provided as delimited data files including date, time and generation flow at 5 minute intervals; and daily water level data for all impoundments.

TU submits the following FERC Study Requests:

1. Ripogenus Flow Excursion Study (Attachment C)
2. Fish assemblage studies for the waters of both projects. Fish assemblage studies are normally approved for relicensings. This will provide current information. Use of established, consistent methodology will establish baselines for comparison for future relicensings of the projects. The specific studies requested (Attachments D through M) are:
    1) Ripogenus-Chesuncook Impoundment Baseline Fisheries Assemblage Study
    2) West Branch of the Penobscot River Below Ripogenus Dam Baseline Fisheries Assemblage Study
    3) North Twin Impoundment Baseline Fisheries Assemblage Study
    4) Millinocket Lake Baseline Fisheries Assemblage Study
    5) Dolby Pond Baseline Fisheries Assemblage Study

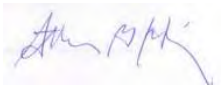
[29] 38 MRS §464-9(A) "T*he project creates an impoundment that is subject to water level fluctuations that have an effect on the habitat and aquatic life in the littoral zone so that the habitat and aquatic life differ significantly from that found in an unimpounded great pond*."

[30] Map of Parcels downstream of Ripogenus Dam copied from the LUPC Zoning and Parcel Viewer accessed at https://maine.maps.arcgis.com/apps/webappviewer/index.html?id=89f9a143c79f4349a40a3ff77975f17a

6) East Millinocket Impoundment Baseline Fisheries Assemblage Study
7) West Branch of the Penobscot River North Twin Dam to Quakish Lake Baseline Fisheries assemblage Study
8) Lower Millinocket Stream and West Branch (Millinocket Tailrace to Dolby Pond) including Shad Pond Baseline Fisheries Assemblage Study
9) Study Request: Millinocket Stream (Millinocket Lake Storage Dam to Millinocket Development) Baseline Fisheries Assemblage Study
10) West Branch of the Penobscot River Below Stone Dam Baseline Fisheries Assemblage Study

Maine TU Council appreciates the opportunity to provide these comments on these important projects and hopes that the Commission will act to allow the resource protection agencies have the information needed to identify potential harms to the resource and thus enable the Commission to balance project harms and benefits.

Respectfully,

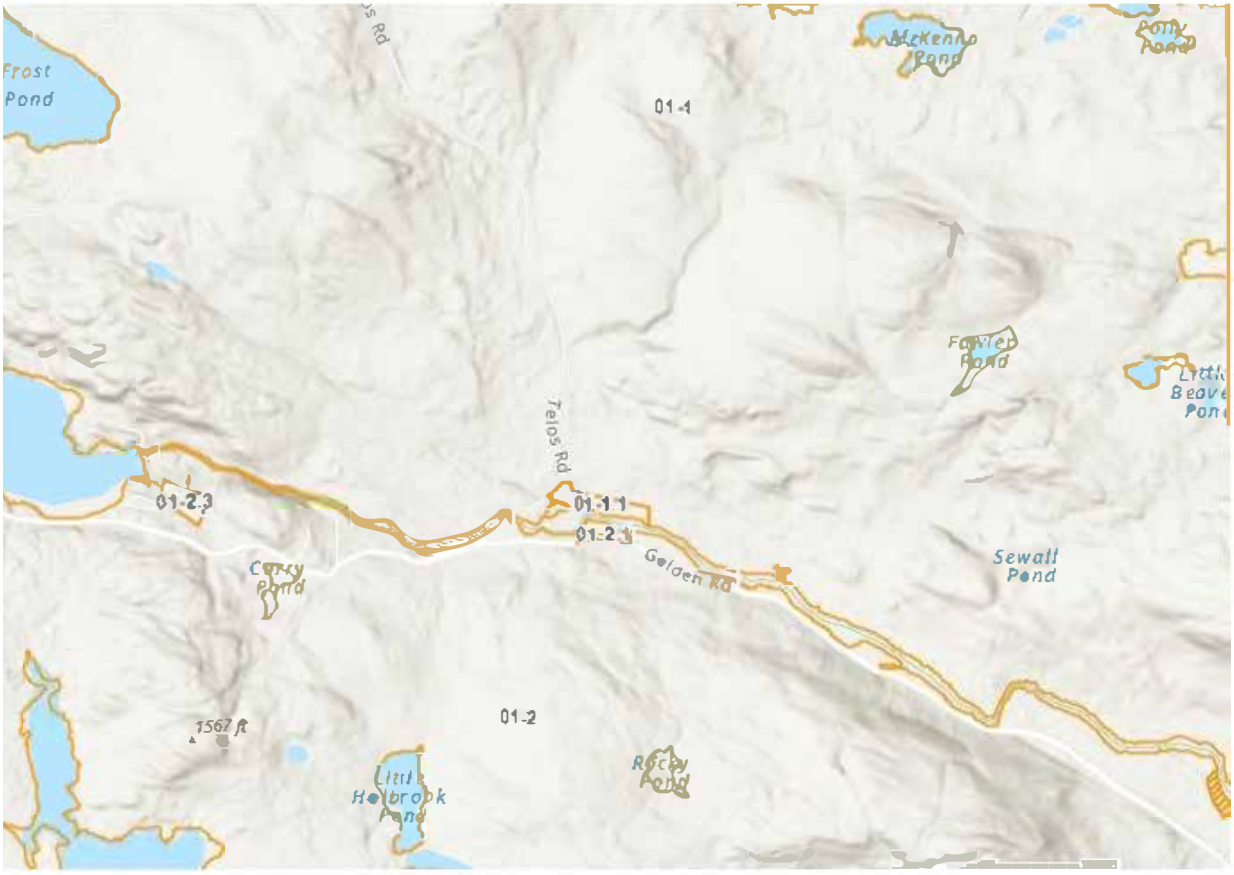


Stephen G. Heinz
Maine TU Council FERC Coordinator

**Attachments:**

A- Map of Parcels downstream of Ripogenus Dam
B- Documents Referenced in the PAD Requested and NOT Provided
C - Study Request: Ripogenus Flow Excursion Study
D - Study Request: Ripogenus-Chesuncook Impoundment Baseline Fisheries Assemblage Study
E - Study Request: West Branch of the Penobscot River Below Ripogenus Dam Baseline Fisheries Assemblage Study
F - Study Request: North Twin Impoundment Baseline Fisheries Assemblage Study
G - Study Request: Millinocket Lake Baseline Fisheries Assemblage Study
H - Study Request: Dolby Pond Baseline Fisheries Assemblage Study
I - Study Request: East Millinocket Impoundment Baseline Fisheries Assemblage Study
J - Study Request: West Branch of the Penobscot River North Twin Dam to Quakish Lake Baseline Fisheries assemblage Study
K - Study Request: Lower Millinocket Stream and West Branch (Millinocket Tailrace to Dolby Pond) including Shad Pond Baseline Fisheries Assemblage Study
L- Study Request: Millinocket Stream (Millinocket Lake Storage Dam to Millinocket Development) Baseline Fisheries Assemblage Study
M - Study Request: West Branch of the Penobscot River Below Stone Dam Baseline Fisheries Assemblage Stud**y**

# Attachment A




Map of Parcels downstream of Ripogenus Dam

# Attachment B

## Documents Referenced in the PAD Requested and NOT Provided

Documents referenced in the PAD, previously requested [TU letter dated October 2, Subject: Second Preliminary Comments of Maine Council of Trout Unlimited on the Notices of Intent and Pre-application Documents for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458)] but not supplied:

1. *(MDIFW 2012) - page 5-92*
2. *(FERC 1996) - page 5-92*
3. *(FishBase 2021c) - page 5-94*
4. *(GLHA 2011) - page 5-95*
5. *(MDMR 2021) - page 2021*
6. *(USFWS 2015a) - page 5-97*
7. *(Midwest Biodiversity Institute &Center for Applied Bioassessment and Criteria [MBI] 2005) - page 5-113*
8. *MDIFW unpublished sampling data from 2017 and 2018 - page 5-122 (footnote)*
9. *Yoder et al. 2008 (Source cited for Lower Millinocket Stream and West Branch (Millinocket Tailrace to Dolby Pond fish assemblage) - page 5-125*

# Attachment C

**Study Request: Ripogenus Flow Excursion Study**

**1. Study Goals and Objectives.**
Document the stability of flows from Ripogenus Dam as they compare to the licensed project minimums. Conduct a 400 cfs flow demonstration to determine the impacts of "generator outage flow" on aquatic organisms.

**2. Relevant resource management goals.** (Under §5.9(b)(3) If the requester is a not a source agency, explain any relevant public Interest.)

Maine's rivers, great ponds and wildlife are, by law, public resources. Sebago Chapter members use the area for fishing and other recreational activities, and thus have a direct interest in the waters affected by project operations.

The minimum flows governing the Ripogenus Project are complex. The PAD describes them on page 4-45 with the exception of flows into the upper gorge on page 4-43: "*minimum flow of 100 cfs is released from Ripogenus Dam into the bypassed reach (Upper Gorge) from July 1 through September 30 annually. Consistent with the August 19, 1997 FERC order approving and modifying the Water Management Plan, the minimum flows into the Upper Gorge are released through the sluice gates at the north end of the dam. During the remainder of the year, a minimum flow of 12 cfs is provided through leakage from Ripogenus Dam into the Upper Gorge. Releases from the Ripogenus Project enter the West Branch and flow 21 miles downstream (from McKay Station) into Ambajejus Lake, which is part of the North Twin Development of the Penobscot Mills Project."* Minimum flows are prescribed for fish spawning or incubation [of salmonid redds], whitewater, station outages and other times.

**3. The requestor, Sebago TU, is a non-governmental organization (NGO).**

**4. Background and Existing Information.** Existing information concerning the subject of the study proposal, and the need for additional information.

The PAD on page 6-5 states: *"Establishment of minimum flow regime for McKay Station through the previous relicensing enhanced fish and aquatic habitat in the West Branch, including spawning and rearing habitat for landlocked salmon. As there have been no changes to Project operations and minimum flows continue to be provided, it is expected that the existing flow regime from McKay Station will continue to support the existing West Branch fishery."* TU reported three low flow events that occurred between late August of 2021 and Mid-September [Maine Council of Trout Unlimited Report of Observed Low Flow Events for the Ripogenus Project (P-2572) dated September 21, 2021]. Sarah Sindo who works downstream of Ripogenus Dam during the summer reported: "*I have been witness to at least 1-2 low water excursion events each of the seven seasons I have been here. An outage will occur at McKay Station resulting in a downriver flow of 300-400 cfs, which comes from Ripogenus Dam. The river will stay at this level for 2-4 hours before McKay Station is restored. Not all, but some of these low water excursions, I have witnessed crayfish and other invertebrates in the now dewatered sections of the river, mostly along the shoreline.*"[31] Apparently, more of these events are occurring than are being reported. Minimum flows requirements make little difference if they are not adhered to.

[31] Sarah Sindo eComment of October 8, 2021

**5. Nexus between Project operation and effects on the resource to be studied.**

Inability of the operator and/or project facilities to maintain minimum flows can have a profound effect of the downstream environment and the organisms that live in it.

**6. Explain how the proposed study is consistent with generally accepted practice in the scientific community.**

Operational data is available from the Ripogenus and has been supplied by Brookfield to document past flow excursions including the one that was reported March 12, 2021. Figure 1 from that report shows the data available. The Excursion Report included graphical data for both flow and power produced at a fine level of detail. Flow data tables could be examined by computer algorithms derived from minimum flow requirements described above and exact dates of excursions, type, magnitude and duration determined. This task has been well within the state of the art for many decades. Regarding the flow demonstration, Brookfield recently proposed and then cancelled a somewhat similar demonstration flow event for its Wyman Project. [email -From: Seyfried, Jason <Jason.Seyfried@brookfieldrenewable.com>; Sent: Tuesday, February 16, 2021 3:35 PM; Subject: Wyman Project (FERC No. 2329-ME) Temporary Flow Variance Request - Agency Consultation]

**7. Describe considerations of level of effort and cost, as applicable, and why proposed study alternatives would not be sufficient to meet the stated information needs.**

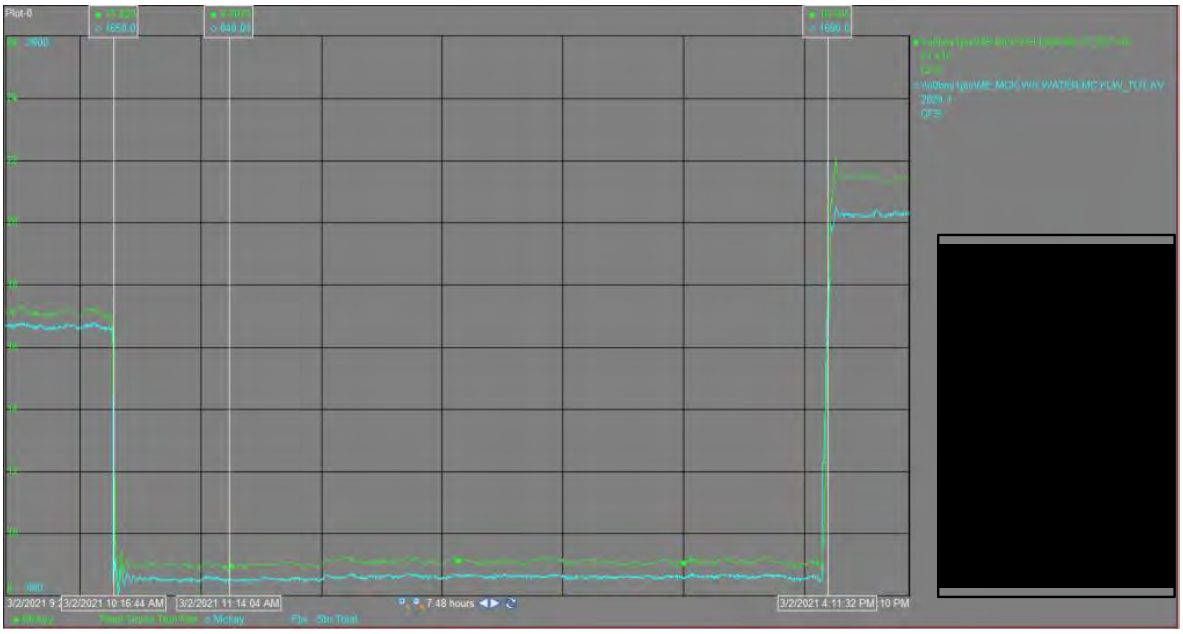
This would be a desktop study except for 400 cfs demonstration. The estimated cost for the Ripogenus Flow Excursion Study is estimated to be approximately $10,000.

**References:**

Maine Council of Trout Unlimited Report of Observed Low Flow Events for the Ripogenus Project (P-2572) dated September 21, 2021

Sarah Sindo eComment of October 8, 2021

Brookfield Flow Excursion Report of March 12, 2021



# Attachment D

**Study Request: Ripogenus-Chesuncook Impoundment Baseline Fisheries Assemblage Study**

**1. Study Goals and Objectives.**
Document the fisheries assemblage in the Project waters for comparison with past studies.

**2. Relevant resource management goals.** (Under §5.9(b)(3) If the requester is a not a resource agency, explain any relevant public Interest.)

Maine's rivers, great ponds and wildlife are, by law, public resources. Sebago Chapter members use the area for fishing and other recreational activities, and thus have a direct interest in the waters affected by project operations.

MDIFW manages the Ripogenus-Chesuncook Reservoir as a coldwater fishery. The objective of the study is to document the existing fisheries assemblage and to collect information about the distribution and abundance of salmonids and other fish species present in the Project waters. Data collected will document the relative abundance and distribution of cold and warm water fish species present in the Project area, evaluate size class information (i.e., adult, juvenile, young-of-year), and species diversity. Size-quality of landlocked salmon has deteriorated in the impoundment causing adoption of special fishing regulations: "*No size or bag limit on salmon less than 16 inches.*"

**3. The requestor, Sebago TU, is a non-governmental organization (NGO).**

**4. Background and Existing Information.** Existing information concerning the subject of the study proposal, and the need for additional information.

The PAD references assemblage data from the last license application: Report on Studies of The Habitat, Fish Populations, and Fisheries of The Ripogenus Project (FERC No. 2572) Study Area, West Branch page 18, table 5. This data was collected in 1960, 1970, and 1981. Netting effort required (linear ft of gill net x hours fished) ranged from 10,700 to 40,350. The most recent data is now forty-years old. Apparent changes in project operations and/or climate, and possible introduction of invasive fish species including smallmouth bass and northern pike make resampling important.

**5. Nexus between Project operation and effects on the resource to be studied.**

The Ripoganus Project Project provides lacustrine and riverine fish habitats that support fish populations, which may be affected by operations. Collection of baseline fisheries information will provide a better understanding of the potential effects of continued operation on resident fish species, especially salmonids including smelt. Smelt populations are known to be the most important forage for landlocked salmon both above and below Ripogenus Dam .

**6. Explain how the proposed study is consistent with generally accepted practice in the scientific community.**

Gill netting is a standard, passive fish sampling method for providing baseline fisheries data.

**7. Describe considerations of level of effort and cost, as applicable, and why proposed study alternatives would not be sufficient to meet the stated information needs.**

The level of effort should be consistent with that of past studies in terms of linear feet of gill net and hours fished. The estimated cost for the baseline fisheries assemblage survey is approximately $20,000.

**Reference:**

Report on Studies of The Habitat, Fish Populations, and Fisheries of The Ripogenus Project (FERC No. 2572) Study Area, West Branch page 18, table 5.

# Attachment E

**Study Request: West Branch of the Penobscot River Below Ripogenus Dam Baseline Fisheries Assemblage Study**

**1. Study Goals and Objectives.**
Document the fisheries assemblage in the Project waters.

**2. Relevant resource management goals.** (Under §5.9(b)(3) If the requester is a not a resource agency, explain any relevant public Interest.)

Maine's rivers, great ponds and wildlife are, by law, public resources. Sebago Chapter members use the area for fishing and other recreational activities, and thus have a direct interest in the waters affected by project operations.

MDIFW manages the West Branch of the Penobscot River below Ripogenus Dam as a coldwater fishery. The objective of the study is to document the existing fisheries assemblage and to collect information about the distribution and abundance of salmonids and other fish species present in the Project waters. Data collected will document the relative abundance and distribution of cold and warm water fish species present in the Project area, evaluate size class information (i.e., adult, juvenile, young-of-year), and species diversity.

Data obtained may also be used as a basis of comparison for future relicensings.

**3. The requestor, Sebago TU, is a non-governmental organization (NGO).**

**4. Background and Existing Information.** Existing information concerning the subject of the study proposal, and the need for additional information.

The PAD documents the results of Fish Species Documented in the Ripogenus Impoundment and West Branch Downstream of the Ripogenus Dam during 1986-1989 Fish Assemblage Surveys. [PAD, page 5-119] Under the table containing the data, Table 5.4-6. The PAD notes: *"Source: GNNC 1991a, MBI 2005."* Apparently there is a Midwest Biodiversity Institute (MBI) Study in existence that has not been provided by the Applicant. Provision of the study would have enabled inclusion of additional detail in this study request.

**5. Nexus between Project operation and effects on the resource to be studied.**

The Ripogenus Project provides lacustrine and riverine fish habitats that support fish populations, which may be affected by operations. Collection of baseline fisheries information will provide a better understanding of the potential effects of continued operation on resident fish species, especially salmonids including smelt. Smelt populations are known to be the most important forage for landlocked salmon both above and below Ripogenus Dam .

**6. Explain how the proposed study is consistent with generally accepted practice in the scientific community.**

Electrofishing and gill netting are standard, fish sampling methods for providing baseline fisheries data. Electrofishing would be conducted in the reach above McKay Station, gill netting in the pools below such as the Little Eddy and Big Eddy.

**7. Describe considerations of level of effort and cost, as applicable, and why proposed study alternatives would not be sufficient to meet the stated information needs.**

The level of effort should be consistent with that of past electrofishing studies conducted by MBI. The estimated cost for the baseline fisheries assemblage survey is approximately $20,000.

**References:**

Great Northern Nekoosa Corporation [GNNC] 1991a

Midwest Biodiversity Institute (MBI) Study 2005 [NOT provided with PAD]

# Attachment F

**Study Request: North Twin Impoundment Baseline Fisheries Assemblage Study**

**1. Study Goals and Objectives.**
Document the fisheries assemblage in the Project waters.

**2. Relevant resource management goals.** (Under §5.9(b)(3) If the requester is a not a source agency, explain any relevant public Interest.)

Maine's rivers, great ponds and wildlife are, by law, public resources. Sebago Chapter members use the area for fishing and other recreational activities, and thus have a direct interest in the waters affected by project operations.

MDIFW manages the North Twin impoundment as a coldwater fishery. The objective of the study is to document the existing fisheries assemblage and to collect information about the distribution and abundance of salmonids and other fish species present in the Project waters. Data collected will document the relative abundance and distribution of cold and warm water fish species present in the Project area, evaluate size class information (i.e., adult, juvenile, young-of-year), and species diversity.

Data obtained may also be used as a basis of comparison for future relicensings.

**3. The requestor, Sebago TU, is a non-governmental organization (NGO).**

**4. Background and Existing Information.** Existing information concerning the subject of the study proposal, and the need for additional information.

The PAD on page 5-120 references "*MDIFW unpublished sampling data from 2016 and 2017*." This makes providing specifics on current information difficult. The Applicant notes: "*There are recent reports that smallmouth bass have become illegally introduced to the impoundment (Kevin Dunham, MDIFW, personal communication, May 2021).*" This indicates that the 2016-2017 data is already out of date.

**5. Nexus between Project operation and effects on the resource to be studied.**

The North Twin impoundment provides lacustrine fish habitat that supports fish populations, which may be affected by operations. Collection of baseline fisheries information will provide a better understanding of the potential effects of continued operation on resident fish species, especially salmonids including smelt.

**6. Explain how the proposed study is consistent with generally accepted practice in the scientific community.**

Gill netting is a standard, passive fish sampling method for providing baseline fisheries data.

**7. Describe considerations of level of effort and cost, as applicable, and why proposed study alternatives would not be sufficient to meet the stated information needs.**

The level of effort should be consistent with that of past electrofishing studies conducted by MBI. The estimated cost for the baseline fisheries assemblage survey is approximately $20,000.

**References:**

Great Northern Nekoosa Corporation [GNNC] 1991b

MDIFW unpublished sampling data from 2016 and 2017 [NOT provided with PAD]

# Attachment G

**Study Request: Millinocket Lake Baseline Fisheries Assemblage Study**

**1. Study Goals and Objectives.**
Document the fisheries assemblage in the Project waters.

**2. Relevant resource management goals.** (Under §5.9(b)(3) If the requester is a not a source agency, explain any relevant public Interest.)
Maine's rivers, great ponds and wildlife are, by law, public resources. Sebago Chapter members use the area for fishing and other recreational activities, and thus have a direct interest in the waters affected by project operations.

MDIFW manages Millinocket Lake primarily as a coldwater fishery. The objective of the study is to document the existing fisheries assemblage and to collect information about the distribution and abundance of salmonids and other fish species present in the Project waters. Data collected will document the relative abundance and distribution of cold and warm water fish species present in the Project area, evaluate size class information (i.e., adult, juvenile, young-of-year), and species diversity.

Data obtained may also be used as a basis of comparison for future relicensings.

**3. The requestor, Sebago TU, is a non-governmental organization (NGO).**

**4. Background and Existing Information.** Existing information concerning the subject of the study proposal, and the need for additional information.

The PAD on page 5-122 references "*MDIFW unpublished sampling data from 2017 and 2018*." This makes providing specifics on current information difficult. The Applicant notes regarding the North Twin impoundment: "*There are recent reports that smallmouth bass have become illegally introduced to the impoundment (Kevin Dunham, MDIFW, personal communication, May 2021).*" As North Twin is immediately upstream and the Applicant states that other species are likely dropping down from these water, the 2017-2018 data is likely already out of date as well.

**5. Nexus between Project operation and effects on the resource to be studied.**

Millinocket Lake provides lacustrine fish habitat that supports fish populations, which may be affected by operations. Collection of baseline fisheries information will provide a better understanding of the potential effects of continued operation on resident fish species, especially salmonids including smelt.

**6. Explain how the proposed study is consistent with generally accepted practice in the scientific community.**

Gill netting is a standard, passive fish sampling method for providing baseline fisheries data.

**7. Describe considerations of level of effort and cost, as applicable, and why proposed study alternatives would not be sufficient to meet the stated information needs.**

The level of effort should be consistent with that of past electrofishing studies conducted by MBI. The estimated cost for the baseline fisheries assemblage survey is approximately $20,000.

**References:**

Great Northern Nekoosa Corporation [GNNC] 1991b

MDIFW unpublished sampling data from 2016 and 2017 [NOT provided with PAD]

# Attachment H

**Study Request: Dolby Pond Baseline Fisheries Assemblage Study**

**1. Study Goals and Objectives.**
Document the fisheries assemblage in the Project waters.

**2. Relevant resource management goals.** (Under §5.9(b)(3) If the requester is a not a source agency, explain any relevant public Interest.)
Maine's rivers, great ponds and wildlife are, by law, public resources. Sebago Chapter members use the area for fishing and other recreational activities, and thus have a direct interest in the waters affected by project operations.

MDIFW manages Dolby Pond as a warm water fishery. The objective of the study is to document the existing fisheries assemblage and to collect information about the distribution and abundance of salmonids and other fish species present in the Project waters. Data collected will document the relative abundance and distribution of cold and warm water fish species present in the Project area, evaluate size class information (i.e., adult, juvenile, young-of-year), and species diversity.

Data obtained may also be used as a basis of comparison for future relicensings.

**3. The requestor, Sebago TU, is a non-governmental organization (NGO).**

**4. Background and Existing Information.** Existing information concerning the subject of the study proposal, and the need for additional information.

The PAD on page 5-123 references GNNC 1991b from the last license application. This data is now 40 years old. No table describing the results of the fish assemblage survey conducted then.

**5. Nexus between Project operation and effects on the resource to be studied.**
Dolby Pond provides lacustrine fish habitat that supports fish populations, which may be affected by operations. Collection of baseline fisheries information will provide a better understanding of the potential effects of continued operation on resident fish species.

**6. Explain how the proposed study is consistent with generally accepted practice in the scientific community.**

Gill netting is a standard, passive fish sampling method for providing baseline fisheries data.

**7. Describe considerations of level of effort and cost, as applicable, and why proposed study alternatives would not be sufficient to meet the stated information needs.**

The level of effort should be consistent with that of past electrofishing studies conducted by MBI. The estimated cost for the baseline fisheries assemblage survey is approximately $20,000.

**Reference:** Great Northern Nekoosa Corporation [GNNC] 1991b

# Attachment I

**Study Request: East Millinocket Impoundment Baseline Fisheries Assemblage Study**

**1. Study Goals and Objectives.**
Document the fisheries assemblage in the Project waters.

**2. Relevant resource management goals.** (Under §5.9(b)(3) If the requester is a not a source agency, explain any relevant public Interest.)

Maine's rivers, great ponds and wildlife are, by law, public resources. Sebago Chapter members use the area for fishing and other recreational activities, and thus have a direct interest in the waters affected by project operations.

MDIFW manages the East Millinocket Impoundment as a warm water fishery. The objective of the study is to document the existing fisheries assemblage and to collect information about the distribution and abundance of salmonids and other fish species present in the Project waters. Data collected will document the relative abundance and distribution of cold and warm water fish species present in the Project area, evaluate size class information (i.e., adult, juvenile, young-of-year), and species diversity.

Data obtained may also be used as a basis of comparison for future relicensings.

**3. The requestor, Sebago TU, is a non-governmental organization (NGO).**

**4. Background and Existing Information.** Existing information concerning the subject of the study proposal, and the need for additional information.

The PAD on page 5-123 references GNNC 1991b from the last license application. This data is now 40 years old

**5. Nexus between Project operation and effects on the resource to be studied.**

The East Millinocket Impoundment provides lacustrine fish habitat that supports fish populations, which may be affected by operations. Collection of baseline fisheries information will provide a better understanding of the potential effects of continued operation on resident fish species.

**6. Explain how the proposed study is consistent with generally accepted practice in the scientific community.**

Gill netting is a standard, passive fish sampling method for providing baseline fisheries data.

**7. Describe considerations of level of effort and cost, as applicable, and why proposed study alternatives would not be sufficient to meet the stated information needs.**

The level of effort should be consistent with that of past electrofishing studies conducted by MBI. The estimated cost for the baseline fisheries assemblage survey is approximately $20,000.

**Reference:** Great Northern Nekoosa Corporation [GNNC] 1991b

# Attachment J

**Study Request: West Branch of the Penobscot River North Twin Dam to Quakish Lake Baseline Fisheries Assemblage Study**

**1. Study Goals and Objectives.**
Document the fisheries assemblage in the Project waters.

**2. Relevant resource management goals.** (Under §5.9(b)(3) If the requester is a not a resource agency, explain any relevant public Interest.)

Maine's rivers, great ponds and wildlife are, by law, public resources. Sebago Chapter members use the area for fishing and other recreational activities, and thus have a direct interest in the waters affected by project operations.

MDIFW manages the West Branch of the Penobscot River North Twin Dam to Quakish Lake as a warm water fishery. The objective of the study is to document the existing fisheries assemblage and to collect information about the distribution and abundance of fish species present in the Project waters. Data collected will document the relative abundance and distribution of fish species present in the Project area, evaluate size class information (i.e., adult, juvenile, young-of-year), and species diversity.

Data obtained may also be used as a basis of comparison for future relicensings.

**3. The requestor, Sebago TU, is a non-governmental organization (NGO).**

**4. Background and Existing Information.** Existing information concerning the subject of the study proposal, and the need for additional information.

This is a small reach, 1.7 miles. The PAD documents the results of a survey conducted by Midwest Biological Institute reported in 2008 [PAD, page 5-124 and 125]. This is another of studies that has been requested but not received making provision of greater detail difficult.

**5. Nexus between Project operation and effects on the resource to be studied.**

The West Branch of the Penobscot River North Twin Dam to Quakish Lake provides riverine fish habitats that support fish populations, which may be affected by operations. Collection of baseline fisheries information will provide a better understanding of the potential effects of continued operation on resident fish species.

**6. Explain how the proposed study is consistent with generally accepted practice in the scientific community.**

Electrofishing is a standard, fish sampling methods for providing baseline fisheries data.

**7. Describe considerations of level of effort and cost, as applicable, and why proposed study alternatives would not be sufficient to meet the stated information needs.**

The level of effort should be consistent with that of past electrofishing studies conducted by MBI. The estimated cost for the baseline fisheries assemblage survey is approximately $5,000.

**References:**

Great Northern Nekoosa Corporation [GNNC] 1991b

Midwest Biodiversity Institute (MBI) Study 2008 [NOT provided with PAD]

# Attachment K

**Study Request: Lower Millinocket Stream and West Branch (Millinocket Tailrace to Dolby Pond) including Shad Pond Baseline Fisheries Assemblage Study**

**1. Study Goals and Objectives.**
Document the fisheries assemblage in the Project waters.

**2. Relevant resource management goals.** (Under §5.9(b)(3) If the requester is a not a resource agency, explain any relevant public Interest.)

Maine's rivers, great ponds and wildlife are, by law, public resources. Sebago Chapter members use the area for fishing and other recreational activities, and thus have a direct interest in the waters affected by project operations.

MDIFW manages the Lower Millinocket Stream and West Branch (Millinocket Tailrace to Dolby Pond) as a warm water fishery. The objective of the study is to document the existing fisheries assemblage and to collect information about the distribution and fish species present in the Project waters. Data collected will document the relative abundance and distribution of cold and warm water fish species present in the Project area, evaluate size class information (i.e., adult, juvenile, young-of-year), and species diversity.

Data obtained may also be used as a basis of comparison for future relicensings.

**3. The requestor, Sebago TU, is a non-governmental organization (NGO).**

**4. Background and Existing Information.** Existing information concerning the subject of the study proposal, and the need for additional information.

The PAD documents sampling conducted by the Midwest Biodiversity Institute (MBI) Study in 2004 on page 5-126. This study was not provided by the applicant making it difficult to provide details of how to repeat it. Sampling data is provided for Shad Pond but not the riverine sections. TU deems this adequate.

**5. Nexus between Project operation and effects on the resource to be studied.**

The Lower Millinocket Stream and West Branch (Millinocket Tailrace to Dolby Pond) including Shad Pond provide lacustrine and riverine fish habitats that support fish populations, which may be affected by operations. Collection of baseline fisheries information will provide a better understanding of the potential effects of continued operation on resident fish species.

**6. Explain how the proposed study is consistent with generally accepted practice in the scientific community.**

Gill netting is a standard, fish sampling method for providing baseline fisheries data.

**7. Describe considerations of level of effort and cost, as applicable, and why proposed study alternatives would not be sufficient to meet the stated information needs.**

The level of effort should be consistent with that of past electrofishing studies conducted by MBI. The estimated cost for the baseline fisheries assemblage survey is approximately $20,000.

**References:**

Great Northern Nekoosa Corporation [GNNC] 1991b

Midwest Biodiversity Institute (MBI) Study 2008 [NOT provided with PAD]

# Attachment L

**Study Request: Millinocket Stream (Millinocket Lake Storage Dam to Millinocket Development) Baseline Fisheries Assemblage Study**

**1. Study Goals and Objectives.**
Document the fisheries assemblage in the Project waters.

**2. Relevant resource management goals.** (Under §5.9(b)(3) If the requester is a not a resource agency, explain any relevant public Interest.)

Maine's rivers, great ponds and wildlife are, by law, public resources. Sebago Chapter members use the area for fishing and other recreational activities, and thus have a direct interest in the waters affected by project operations.

MDIFW manages the Millinocket Stream (Millinocket Lake Storage Dam to Millinocket Development) as a warm water and coldwater fishery. The objective of the study is to document the existing fisheries assemblage and to collect information about the distribution and abundance of salmonids and other fish species present in the Project waters. Data collected will document the relative abundance and distribution of cold and warm water fish species present in the Project area, evaluate size class information (i.e., adult, juvenile, young-of-year), and species diversity.

Data obtained may also be used as a basis of comparison for future relicensings.

**3. The requestor, Sebago TU, is a non-governmental organization (NGO).**

**4. Background and Existing Information.** Existing information concerning the subject of the study proposal, and the need for additional information.

The PAD documents sampling conducted by the Midwest Biodiversity Institute (MBI) Study in 2004 on page 5-128. This study was not provided by the applicant making it difficult to provide details of how to repeat it.

**5. Nexus between Project operation and effects on the resource to be studied.**

The Millinocket Stream (Millinocket Lake Storage Dam to Millinocket Development) provides riverine fish habitat that support fish populations, which may be affected by operations. Collection of baseline fisheries information will provide a better understanding of the potential effects of continued operation on resident fish species, especially salmonids including smelt.

**6. Explain how the proposed study is consistent with generally accepted practice in the scientific community.**

Electrofishing is a standard, fish sampling methods for providing baseline fisheries data.

**7. Describe considerations of level of effort and cost, as applicable, and why proposed study alternatives would not be sufficient to meet the stated information needs.**

The level of effort should be consistent with that of past electrofishing studies conducted by MBI. The estimated cost for the baseline fisheries assemblage survey is approximately $20,000.

**References:**

Great Northern Nekoosa Corporation [GNNC] 1991b

Midwest Biodiversity Institute (MBI) Study 2008 [NOT provided with PAD]

# Attachment M

### Study Request: West Branch of the Penobscot River Below Stone Dam Baseline Fisheries Assemblage Study

**1. Study Goals and Objectives.**
Document the fisheries assemblage in the Project waters.

**2. Relevant resource management goals.** (Under §5.9(b)(3) If the requester is a not a resource agency, explain any relevant public Interest.)

Maine's rivers, great ponds and wildlife are, by law, public resources. Sebago Chapter members use the area for fishing and other recreational activities, and thus have a direct interest in the waters affected by project operations.

The West Branch of the Penobscot River Below Stone Dam provides minimal fishing opportunity due to dewatering. The objective of the study is to document the existing fisheries assemblage and to collect information about the distribution and abundance of salmonids and other fish species present in the Project waters. Data collected will document the relative abundance and distribution of cold and warm water fish species present in the Project area, evaluate size class information (i.e., adult, juvenile, young-of-year), and species diversity.

Data obtained may also be used as a basis of comparison for future relicensings.

**3. The requestor, Sebago TU, is a non-governmental organization (NGO).**

**4. Background and Existing Information.** Existing information concerning the subject of the study proposal, and the need for additional information.

The PAD documents the results of the 2004 Midwest Biodiversity Institute (MBI) Study on page 5-131. Provision of the study would have enabled inclusion of additional detail in this study request.

**5. Nexus between Project operation and effects on the resource to be studied.**

The West Branch of the Penobscot River Below Stone Dam provides riverine fish habitat that support minimal warm water fish populations fish populations, which may be affected by operations. Collection of baseline fisheries information will provide a better understanding of the potential effects of continued operation on resident fish species.

**6. Explain how the proposed study is consistent with generally accepted practice in the scientific community.**

Electrofishing is a standard, fish sampling methods for providing baseline fisheries data.

**7. Describe considerations of level of effort and cost, as applicable, and why proposed study alternatives would not be sufficient to meet the stated information needs.**

The level of effort should be consistent with that of past electrofishing studies conducted by MBI. The estimated cost for the baseline fisheries assemblage survey is approximately $20,000.

**References:**

Great Northern Nekoosa Corporation [GNNC] 1991b

Midwest Biodiversity Institute (MBI) Study 2008 [NOT provided with PAD]

Kimberly D. Bose, Secretary October 9, 2021

Federal Energy Regulatory Commission

888 First Street, NE

Washington, DC 20426

**Subject: Comments and Needed Studies Re; September 24, 2021 Filing Re: Ripogenus Hydroelectric Project (FERC No. 2572-133) Penobscot Mills Hydroelectric Project (FERC No. 2458-247) Supplemental Information – Source Information and Existing Studies**

**Dear Secretary Bose,**

**Via FERC E-filing**

**On September 30, 2021, I electronically filed comments on the Pre-Application Document (PAD) and Scoping Document 1 (SC1) for the now combined Ripogenus and Penobscot Mills Projects. As I noted, the Projects' impoundment and riverine reaches no longer support fish and aquatic invertebrate communities at the levels observed in the 1980s (cited in the 1992 license). As I wrote in my September 30. 2021 filing, I participated and authored many of the studies listed in the Licensee's September 24, 2021 filing. Due to an almost forty-year data gap and a major change in project operations, the 1980s studies are not relevant to existing peaking operations and flow regimes. The fisheries and aquatic communities need to be returned to the 1992 baseline established by the Environmental Impact Statement. In order to restore project fisheries and aquatic communities, a great deal of information needs to be collected. This is the responsivity of the licensee. I now offer my comments and recommendation for much needed studies.**

**Impoundments**

1) **Determine the loss of littoral acreage as it changes with impoundment elevations and time.**

2) **For the Ripogenus Impoundment, based on the results of Normandeau's 1980 survey, determine the change (if any) in the Ripogenus Impoundment plankton communities.**

3) **Determine the abundance, condition and angler utilization of impoundment (Ripogenus and North Twin) salmonid (including Lake whitefish in the Ripogenus Impoundment) and burbot (Lota lota) populations**

**Riverine reaches**

1) **The river including by-passed reaches are a public resource. The licensee should not be permitted to enjoy the financial gain of this resource without mitigation which compensates the resources beyond the modest tradeoffs allowed when the project's two mills supported 1400 jobs 30 years ago. The Licensee states no new fishery studies are needed without providing <u>current</u> supporting data e.g., recent creel survey, age-growth and survival information. How is it possible for the licensee to make and defend such a statement without**

**supporting documentation? FERC must require studies to determine the abundance, condition, growth and angler utilization of West Branch salmon populations in all river reaches within and below the project areas. The data should be broken out by wetted and by-passed river segments to allow analysis of mitigation opportunities.**

**1a) For the West Branch below McKay Station and extending to Debsconeag Falls, using radio tagging determine;**

**Any seasonal change in up or downstream salmon movement in response to peaking operations**

**AND**

**Any response, including lateral movement, to peaking flows that could cause changes in salmonid feeding behavior, survival or fishing opportunity**

**AND**

**Any post spawning/overwintering salmon mortalities resulting from historically low winter and early spring low-flow events.**

2) **Upper Gorge;**

   **Determine a suitable method of providing (July 1st – September 30th) flows cooler than those provided by surface flows passed through the Ripogenus Dam log sluice gate.**

   **Conduct a flow study an determine a suitable October 1st – June 30 environmental flow and confirm that the July 1st to September 30th flow continues to meet fisheries objectives.**

3) **Determine any change in smelt (Osmerus mordax) abundance ("drift") below McKay, North Twin, Dolby and Millinocket (formerly the Grinder Room) Stations. Duplication of GNP's weekly collections referenced in the Licensee's September 24, 2021 filing would be preferred.**

4) **Using Normandeau Associates 1981 marco-invertebrate methods (Surber, rock baskets) and collections sites, identify changes (species abundance and composition) in the aquatic insect communities.**

5) **For the West Branch below McKay Station, determine new minimum flow goals, including flows that protect the Holbrook Bypass Stream. This critical mitigation measure was actually dewatered a number of times in 2021.**

6) **Determine if Backchannel (the dewatered West Branch channel below Stone Dam) upstream fish passage is desired (there maybe a need to prevent exotic species introductions) or needed at Stone Dam.**

**Water management**

**Develop (from an independent peer reviewed source) a water management criteria that will ensure that (yet to be determined) minimum flows goals below Ripogenus Dam and McKay Station and downstream of North Twin Dam can be met. Any license must to be constructed to ensure full compliance. And emergency deviation should only be allowed after consultation with the Maine Department's of Environment Protection and Inland and Fisheries and Wildlife.**

**For all facilities, develop and implement state-of-the-art ramping rates that will protect aquatic insects and juvenile and adult salmonids**

**Angler access**

**Unfortunately, we live a period where industry and populations are threatened by persons whom would do harm to the American way of life. One of the results is the fencing off of a number project facilities that results in lost/reduced angler access and fishing opportunity. Fences at McKay and North Twin, Millinocket (formerly the Grinder Room) Stations limit angler access, and vehicle access to the Dolby tailrace is blocked and foot access difficult. Given that boat access is presently allowed to the (turbine) draft tubes, it seems reasonable to allow foot access to similar locations. The entire drainage is a public resource. Recreational opportunity should not be prohibited or inhibited by the licensee. Access is easy at many of the licensee's other projects in Maine including but not limited to Harris Dam and Station on the Kennebec, Welden Dam and Station and Milford Dam and Station on the main stem Penobscot. Why not all the West Branch dams and stations?**

**Develop a suitable website that provides both real time flow and elevation information as well access to archival information.**

**Maine Departments of Environmental Protection and Inland fisheries and Wildlife are the state agencies charged with responsibility for project resource protection and management. These two agencies must have full oversight in all studies and data analysis.**

**Thank you for the opportunity to comment and to purpose necessary studies**

**Ed Spear**

**307 Mt Hope Ave**
**Bangor, Me 04401**
**Phone: 207-217-4288**

**PENOBSCOT NATION**

DEPARTMENT OF
NATURAL RESOURCES

JOHNS BANKS, DIRECTOR

12 WABANAKI WAY
INDIAN ISLAND, ME 04468
TEL: 207/827/7776
FAX: 207/817/7466

Kimberly D. Bose, Secretary

October 12th, 2021

Federal Energy Regulatory Commission

888 First Street, NE,

Washington, D.C. 20426

**RE: Penobscot Mills (P-2458-247) and Ripogenus (P- 2572-133) Notice of Intent, Pre-application document, Scoping document #1 and study requests**

Dear Secretary Bose,

The Penobscot Indian Nation (PIN) has reviewed the Notice of Intent (NOI), Scoping Document #1 (SD1), and the Pre-Application Document (PAD) filed with the Federal Energy Regulatory Commission (FERC) for the Penobscot Mills and Ripogenus Projects, located on the West Branch of the Penobscot River in Maine and has drafted comments accordingly. The PIN is unable to completely assess the cultural, biological and socioeconomic impacts of relicensing of the projects, and to draft appropriate study requests, due to the lack of information and extensive exclusionary detailing perpetuated by the licensee in the PAD, and NOI. The PIN submitted an Extension of Time request to the FERC on 9/16/21 for an additional 90 days to review the currently unavailable information not included in the PAD and NOI and to prepare study requests. However, on 9/28/21, the FERC denied the request. The FERC went on to request additional data, similar to the multiple agency requests, on 10/8/21.

**Agency Support**

The PIN would like to express its support for the comments and all study requests submitted by our partner agencies, the US Fish and Wildlife Service (USFWS), National Ocean and Atmospheric Administration (NOAA) the Maine Dept. of Marine Resources (MDMR), and the Maine Dept. of Environmental protection (MeDEP). The PIN works collaboratively with these agencies and designs our comments and study requests accordingly.

**Tribal History and Federal Lands**

The Penobscot Nation has inhabited the Penobscot River, including the West and East Branches, from time immemorial. This is the Nation's aboriginal domain. The Nation has never ceded its related aboriginal title to the River and its branches in any treaty and Congress has never extinguished that aboriginal title. It is the Nation's position that

Ripogenus and the Penobscot Mills Projects, located on the West Branch of the Penobscot River, occupy federal lands, the Penobscot Reservation. To the extent that the Scoping Documents states otherwise, the Nation disagrees.

**Back Channel**

The PAD and supporting documents refer to the West Branch of the Penobscot River below Stone Dam as "The Back Channel". This is terminology is offensive to the PIN and is believed to have been adopted by the previous licensee to diminish the importance of the river channel and to create public confusion as to what section of the river is really being talked about. The PIN request that this nomenclature cease from being used in this proceeding.

**Tribal Needs:**

The FERC, on July 23, 2003, issued a *Policy Statement on Consultation with Indian Tribes in Commission Proceedings* (18 CFR Part 2, Docket No. PL03-4-000; Order No. 635) In that statement, the FERC created a Tribal liaison position to help Tribes actively engage in FERC matters. The PIN would like to express its strong desire to consult with the Tribal liaison at the FERC as soon as possible, such that Tribal issues and concerns can be articulated to the FERC within its' process guidelines and obligations. The PIN had no knowledge that such a position even existed, but looks forward to consulting with the FERC liaison about this important relicensing and others in the Penobscot River drainage.

Additionally, the PIN asked the FERC about the establishment of baseline conditions at the project for environmental review and for the analysis of alternatives at the projects. Specifically the PIN asked during the Scoping meeting held on 9/9/21 about how the 2018 American Rivers court case, which vacated Alabama Power's project license and remanded the matter back to FERC for further consideration, would affect the FERC process for the current relicensing. The FERC responded in their letter dated 9/28/21 that the case as ongoing but documents had been issued since the verdict and the FERC provided a link to the updated draft supplemental environmental impact statement (DSEIS) for the Coosa River Hydroelectric project. The DSEIS was an excellent read, however the PIN was not able to find any information as to how the DSIES considered the historic condition as the baseline condition. The PIN would ask that the FERC Tribal liaison, or other FERC staff, work with the PIN to understand this case, the connections to the cumulative impacts of the projects in this relicensing and the use of the historic, pre-dam conditions for analysis by the FERC.

**Environmental Justice**

The PIN also has concerns of Environmental Justice surround the continued operation of the projects, as they may disproportionately affect minority and low-income people living in the region. The PIN asks that FERC staff provide guidance to the stakeholder as to the environmental justice concerns at the project, any recent changes in the FERC NEPA analysis that may or may not include sections on environmental justice, and how they could be related to these projects.

**Socioeconomic Working Group**

The Klamath Hydroelectric project (P-2082), during relicensing in the early 2000's, created a Socioeconomic Working Group during the Scoping process to assess the socioeconomic impacts of the projects. The working group drafted a study plan together and submitted it for review in 2002. The group then recommended the study be conducted in two phases. The Final Technical report was released in February of 2004. The PIN request that the FERC provide a pathway forward to establishing such a working group in this proceeding. The PIN finds itself without the technical expertise to comprehensively develop a study plan to assess the socioeconomic conditions in the region. The PIN therefore believes a Socioeconomic Working group should be established immediately. Members could include a variety of stakeholder from the Millinocket region, Penobscot and Piscataquis counties and subject matter experts available at the University of Maine in Orono. The FERC is well versed in the proper creation of such a group and process, and the PIN will rely upon the FERC and its Tribal Liaison to help promote and execute this most important matter.

**NOI Comments**

Ripogenus (P-2572)

**Section 8V.** The PIN is an affected Native American Tribe with Tribal lands and Treaty reserved sustenance fishing rights negatively affected by continued project operations.

**PAD Comments**

**Section 5.1.2.**

The description of the uses of the Penobscot watershed and surrounding area of the projects focuses on timber, pulp and paper, and hydro development. It falls short in describing other significant uses of the watershed, especially the cultural uses by Penobscot Nation. The licensee narrative creates a false illusion that industrial/logging are all that have ever existed or are important.

**Section 5.1.3.**

This section contains no mention of cultural uses by the tribe. Tribal cultural uses are not adequately explained and should not fall under recreational uses. Many areas of the PAD makes make no mention of the long history of the Penobscot Nation throughout the project areas. This history is clearly demonstrated by the various place names which are Penobscot/Wabanaki : (Pemadumcook -"lake with gravelly or sandy bottom or sand bars"; Millinocket – "admirable place"; Ambajesus – "eddy place; Katahdin; Chesuncook; Penobscot.)

*Downstream uses and aquatic life* – The applicant states that the flows from the projects are beneficial to downstream aquatic habitat and spawning areas within the West Branch and mainstem. However, there is no documents, studies, references, etc that are provided to support these statements. This should be quantified and documented. Furthermore, while the Penobscot Mills dams are operated "run-of-river" they are certainly affected by the upstream Ripogenus Project flows. What is the cumulative effects of both projects within their project areas as well as downstream?

**Section 5.3.9.**

**Water Quality** (general comments)

-*Existing water quality of Ripogenus*.

The data provided for the previous license is outdated (1986-88) and needs to be redone to demonstrate attainment with water quality standards. The applicant states that the Watyer quality (WQ) monitoring demonstrated there was no degradation of WQ due to the operation of the Ripogenus Project. This is misleading. Meeting water quality standards does not mean there is no degradation, just that criteria for that class are met. The licensee also makes unsupported claims that the operation of the Ripogenus dam limits the severity of a dissolved oxygen deficit in the hypolimnion and enhances removal of nutrients from the impoundment and provides valuable food resource to the West Branch.

-*Existing water quality of Penobscot Mills project*

Much of the water quality data referenced in the PAD is outdated and needs to be repeated. While the impoundments met the DO criteria for class C at that time, these waters have been upgraded to Class B since the last relicensing. The old data provided would not meet class B criteria. New data is needed to demonstrate whether the waters will attain class B criteria.

The applicant makes a simple statement that Lower Dolby Pond had elevated chlorophyll-a and turbidity and that "good water quality conditions are due to sustained and consistent flows provided by the storage withdrawals". Dolby has a long history of poor water quality and significant algal blooms, that are well documented by PIN and ME DEP. The 2016 Integrated Report Table 5.3-9 on (pg 5-69) indicates that water quality in Dolby Pond was not meeting water quality standards due to DO and nutrient issues. While the primary cause of the non-attainment was from phosphorous loading from an upstream discharge, the impoundment created by the Dolby Dam is a contributing factor

as it serves as a "cooker" by providing ideal conditions for blooms to develop. The dam also further exacerbates the blooms by allowing phosphorous to settle into sediments within the impoundment which become available during anoxic conditions when the impoundment thermally stratifies. These nutrient rich sediments will continue to contribute to phosphorous loading and potential algal blooms even after the discharge levels are reduced or cease.

-*West Branch Penobscot Below Stone Dam* –Table 5.3-9 (pg 5-69) lists river reaches in the Penobscot Mills Project that are listed in Category 4 of Maine's 2016 Integrated Report. The report lists the 5.1 mile segment of the West Branch below the outlet of Quakish Lake to the confluence of Millinocket Stream as being impaired and not meeting water quality standards due to flow diversion modifications for the Quakish Lake/Stone Dam. While DEP waived CWA Section 401 certification during the last relicensing of the project, this shows that the project is not meeting water quality standards and will continue to not meet standards under the current operation.

Table 6.1-3 list comments from GLHA regarding potential effects and resource issues associated with the projects. PIN contends that these responses are inadequate and misleading.

- Some of the comments state that the West Branch below Stone Dam is difficult to access and that use of the area is minimal suggesting there is no need to study the area. In other sections of the PAD (Article 412) the applicant reports on the enhancements they have made including seeded and maintained access roads to the area and creation of a wildlife management area. PIN staff have travelled by vehicle during summer 2021 to this area without any difficulty. Their statement that "angler use is minimal" is the result of poor aquatic habitat quality and insufficient flows to support a desirable fishery. Restoring flows to this river segment would improve the fishery.
- Potential effect on RTE species – GLHA lists the presence of several RTE species identified by ME DIFW in the project areas and comments that there are not any anticipated adverse effects on the species because there are no proposed operational changes. The mere presence of these RTE species is not evidence that the species are not detrimentally harmed by the operation of the dams. The licensee should provide additional data about the health of the populations, whether they are sustainable and at what levels under the current flow regimes, and whether they would be enhanced by alternative flow regimes.

**<u>Toxic Metals</u>**

The PAD is misleading on the topic of toxic metals, particularly mercury. The licensee states that they found no difference in mercury levels in sediments from the impoundments with drawdowns vs control lakes and that FERC concluded no evidence of project operations leading to increased mercury levels. However, the conclusion of many of the agencies on the Article 404 and 405 studies from the previous license was that there appears to be a relationship between drawdowns and mercury levels. The agencies generally agreed that the 404 and 405 study requirements were met, but they recommended that the role the operation of the dams plays on mercury levels needs additional study, including mercury levels in loons (add references including meeting notes and letters from the agencies). The licensee was very selective about what they chose to summarize from the Haines and Norton 1999 study and only included bulleted statements from the study that support their claim that the project flow regime does not affect mercury levels, and do not include any results or statements from the study that suggest otherwise. We request that FERC require the applicant to conduct additional/continued studies on toxic metals in fish, sediments, water, and piscivorous birds to demonstrate that the dams are not contributing to the unsafe levels of mercury that require issuance of fish consumption advisories. We also think that routine testing of fish from project waters should be required of the applicant to advise recreational and sustenance anglers about the safety of consuming fish from these waters.

*Loon and eagle productivity from project areas* – The PAD references studies about nesting productivity of eagles and loons from the project waters, but only addresses the availability of nesting sites. Elevated levels of mercury in the foods of loons and eagles are known to have a detrimental effect on the productivity of these piscivorous birds. Burgess and Meyer (2008) found that maximum observed loon productivity dropped 50% when fish Hg levels were 0.21 ug/g (wet wt.), and failed completely when fish Hg concentrations were 0.41 ug/g. The PAD indicates that mercury levels in salmonid species monitored in 2015 exceeded the Maine DHHS guidelines for consumption but did not provide any data on fish tissue concentrations. The licensee should provide information not only about availability

of nest sites, but also about the number of chicks that hatch, survival of the chicks, and whether the mercury concentrations in the food base from the project waters is at a level that could impair reproduction.

**Shortcomings of Proposed Studies**

Table 6.2-2 provides details of proposed studies by the applicant which need to be expanded.

1. Water Quality Study - This water quality work should not be limited to just the deep hole in riverine impoundments such as Dolby. Additional sites should be included to properly characterize water quality conditions throughout the impoundment, including the inlet and the main channel upstream of the dams. Water quality standards are more easily met at the deep hole because attainment cannot be measured below the point of thermal stratification. Furthermore, 38 MRSA 464 13C states that where mixing is inhibited due to natural topographical features in an existing riverine impoundment, compliance with numeric dissolved oxygen criteria may not be measured within that portion of the impoundment that is topographically isolated. Such natural topographic features may include, but not be limited to, natural deep holes or river bottom sills. Hence, if the licensee only takes measurements in the deep hole, they will argue that they meet WQS when there may be other more representative areas of the impoundment that are not attaining standards.
2. Macroinvertebrate Survey - This survey must include macroinvertebrate sampling in the West Branch downstream of the Stone Dam (Back Channel). The survey plan does not list this area as one of the proposed sites. The purpose of this work is to determine whether aquatic life criteria are being attained. Without benthic macroinvertebrate data from this site ME DEP will be unable to determine whether aquatic life criteria are being met.
3. Recreation and Land Management Inventory - This plan should include removal or marking of navigational hazards, particularly in Dolby Pond. There are many deadheads and standing trees that are an impediment to recreational/navigation in this area.

PIN Water Resources Program also believes that the licensee should be doing a study to determine the role that the Dolby dam has on dissolved oxygen levels, nutrients, and algae in the impoundment and downstream river. Dolby has a long history of episodic cyanobacteria blooms. The impoundment creates an environment that allows the algae to flourish when the right conditions are present. We are concerned with the phosphorous that has deposited in the sediments in the anoxic zone and becomes available. This situation would not exist if the dam was not present.

References:


- Methylmercury exposure associated with reduced productivity in common loons.

  Burgess NM, Meyer MW. Ecotoxicology. 2008 Feb; 17(2):83-91. doi: 10.1007/s10646-007-0167-8. E pub 2007 Nov 25.PMID: 18038272


**Section 5.1**

> "Populations in the towns of Millinocket and East Millinocket are expected to continue to decrease by approximately 44 percent between 1970 and 2036, compared to an expected increase in population by 35 percent at the state level." (EMDC 2020)
>
> "The mean household income in 2019 was $40,890 for Piscataquis County and $50,808 for Penobscot County, compared to $57,918 for the state in 2019." (USCB 2019)
>
> "The estimated 2019 population of Piscataquis County was 16,785 people, reflecting a 4.3 percent decrease over the nine-year period between 2010 and 2019. The 2010 census reported that Penobscot County has a population of 153,923. The estimated 2019 population of Penobscot County was 152,148 people, reflecting a 1.2 percent decrease over the nine-year period between 2010 and 2019." (U.S. Census Bureau [USCB] 2019)

These quotes from Section 5.1 are insufficient to describe and evaluate the socioeconomic resources of the region. However, they do paint a picture of economic distress, with a shrinking population. This condition is inconsistent with the entire State of Maine and goes to elucidate the fact that the Millinocket region has suffered tremendous socioeconomic distress and crisis since the mills have been closed during the last licensing period. The mills ran on electric power generated by the projects. Now the energy goes into the grid without supporting the local community. The past dedication of public resources was done with support for the local mills and community. The entire situation has changed. A robust socioeconomic study must be conducted.

There is a lack of information concerning the construction of the projects, the past relicensing process, the Great Northern Paper company mills in Millinocket and East Millinocket, Maine, and the massive changes in the socioeconomic conditions experienced by the local community and the state of Maine since the last relicensing.

Great Northern Paper (GNP) Company was founded in the late 1800's. The company created the "Magic City" in the north Maine woods where no organized town had been before. GNP contracted for homes, tenements and even a hotel to be built in the city to supply housing for workers at the mills. (http://greatnorthernpaperhistory.com/the-paper-giant/millinocket-grows.html) GNP built and maintained the Penobscot Mills and Ripogenus projects specifically to provide energy to their mills and to provide an economic advantage over its competitors. It was the first paper mill to have an electrical generation and distribution facility built into the plant. (https://en.wikipedia.org/wiki/Great_Northern_Paper_Company) In the 1940's the timberland owned by GNP had grown to over 5 million acres. In 1977 GNP was still Maine's second largest private employer after Bath Iron Works. At one time GNP's was the nation's largest industrial hydro-electric system, producing enough power to electrify a city of 450,000 or, comparably, almost half the homes in Maine. (https://damnyankee.com/great-northern-paper)

The history of GNP in Maine, its control of the local socioeconomic conditions, and the contentious nature of the relicensing in the late 1980's and early 1990's is not mentioned in the PAD. However, it is this history, and the massive changes that have happened in the Millinocket region since the last relicensing, that makes these matters of paramount importance to the FERC Scoping process where socioeconomic conditions in the area have to be considered in the upcoming environmental analysis inherent in the FERC process.

The last relicensing for these projects was historical in its size, scope and contentiousness. Numerous state legislators made comments during the proceedings, asking the FERC to not impose economic hardships on GNP for environmental concerns, as these would have potentially effected GNP's ability to be competitive and maintain the high paying jobs for the local economy. In a letter dated 4/22/1993 the Maine state commissioner for the MeDEP waived the Dept's authority to certify Water Quality standards (order #L-17166-32-A-N) for the West Branch below the Stone Dam. This waiver was based on political pressure and the issue of economics for the projects and recommended minumu flows in the area. Additionally, the FERC was sued by the Conservation Law Foundation after the license orders were issued. (United States Court of Appeals for the District of Columbia circuit) Argued April 20, 2000, Decided June 23, 2000. No. 99-1035)

The complexity and contentiousness of the last relicensing should be included in any project history by the licensee or the FERC. Perhaps there are lessons to be learned from these past events that will eliminate the need for extensive and expensive legal action to ensue during or after this relicensing proceeding. However, with the incomplete background information within the licensee produced PAD, the FERC and all other stakeholders will find it extremely difficult to assess the socioeconomic concerns of the region that have dramatically changed since the licensee purchased the projects and closed down the paper mills.

**SD1 Comments-**

**Section 1.0.**

The section explains that the projects do not occupy federal lands. The Penobscot Nation has inhabited the Penobscot River, including the West and East Branches, from time immemorial. This is the Nation's aboriginal domain. The Nation has never ceded its related aboriginal title to the River and its branches in any treaty and Congress has never extinguished that aboriginal title. It is the Nation's position that Ripogenus and the Penobscot Mills Projects, located

on the West Branch of the Penobscot River, occupy federal lands, the Penobscot Reservation. To the extent that the Scoping Documents states otherwise, the Nation disagrees.

**Section 3.4.**

SD1 indicates that project decommissioning is not a reasonable alternative to relicensing the project with appropriate environmental measures. No studies have been conducted of any kind in the area to assess the negative affect of modern project operations on the natural or human environment. The record of resource issues to date is incomplete, as a complete socioeconomic study has not been conducted. This study will be needed for the NEPA analysis and currently does not exist. The socioeconomic resource concerns investigated and explained in such a report may lead the FERC to the decision to consider decommissioning and removal for all the projects during its analysis.

**Section 4.1.**

The PIN would lie to point out that there are potentially many other resources that are cumulatively effected by the project and its existence over decades. The socioeconomic conditions of the local areas have changed dramatically since the last relicensing. These resource issues should be added to the list in Section 4.1.

**Section 4.1.6**.

There is no mention of PIN cultural resource concerns based on current operations, which have no connection to the National Register of Historic places. There is also no mention of other cultural connections from the local community and the State of Maine.

The PIN appreciates the careful consideration of these comments and study request by the FERC. If there are any questions for the PIN about these comments, please send them along at your convenience. As issues come to light that were not previously described by the PAD, SD1 or the PIN, the Tribe will alert the FERC to these issues accordingly.

Sincerely,

Daniel McCaw

Fisheries Program Manager
Penobscot Indian Nation
12 Wabanaki Way,
Indian Island, ME 04469

**PIN study request-**

**Socioeconomics Study**

*§5.9(b)(1) –* ***Describe the goals and objectives of each study proposal and the information to be obtained.***

The goals of the study would be to describe the existing socioeconomic environment in the study area, including population, housing, economic development, public services, local energy production, State of Maine statues for energy production in the future, fiscal conditions, and infrastructure.

The study would describe socioeconomic resource trends under the existing condition, summarize the existing condition of the recreation resources in the study area and describe the current Project and social and environmental measures as they relate to the socioeconomic factors.

The study would also describe changes in employment or income associated with modifications to recreational potential for the river in existing and pre-dam conditions.

The study would describe the current socioeconomic condition of the Maine Tribes and identify socioeconomic issues and concerns.

The study would also serve as a source of information in considering other options for the projects, to include decommissioning and removal.

To understand incremental Project effects on socioeconomic resources, it is important first to characterize the existing population demographics, local human resources and public services, the local and tribal economy, as well as pertinent trends in such factors. It will be necessary to identify the study area in terms of the geographic extent of the potential incremental Project's sphere of influence on the socioeconomic condition as well as to identify likely differences across regions in the types of socioeconomic factor effects. The existing information is used to identify current socioeconomic conditions and expected trends in the study area. This is one of many reasons a Working group should be established: to define these parameters for the study.

The results of this study will provide information to satisfy FERC license application requirements specific to Project-related effects on the socioeconomic environment as specified in the applicable sections of 18 CFR Parts 4 and 16.

*§5.9(b)(2) –* ***If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.***

Not applicable.

*§5.9(b)(3) –* ***If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.***

The requestor is a Federally-Recognized Indian Tribe, the Penobscot Indian Nation.

*§5.9(b)(4) –* ***Describe the existing information concerning the subject of the study proposal, and the need for additional information.***

The PIN knows of no such study or data available, with the exception of the population and census data contained within the PAD.

*§5.9(b)(7) –* ***Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.***

Cost and effort would depend on the number of alternatives included in the analysis and the amount of existing information. We anticipate that most or all of the information needed for this analysis already exists, however the information would need to be analyzed and findings to be drafted. A potential cost of $20,000 to $40,000 may be reasonable for such an extensive analysis. This study will require several months to two years of effort to complete. The licensee did not propose any alternative studies.

October 14, 2021

**FERC Project 2572**
**Article 402**

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

***Electronically Filed***

**Subject: Ripogenus Project, FERC No. 2572; Trout Unlimited Minimum Flow Complaint**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), licensee for the Ripogenus Project located on the West Branch of the Penobscot River in Maine, submits this letter in reply to Commission correspondence dated October 4, 2021, in which the Commission requests additional information regarding a complaint filed on September 21, 2021 by Mr. Stephen Heinz, writing on behalf of the Maine Council of Trout Unlimited (TU), that alleges two deviations from minimum flow requirements at the Project. The Commission requests that GLHA file a response to these allegations within 15 days (i.e., by October 19th) that includes:

> *(1) a description of your required flows on August 30 and September 16, 2021, based on the date, time and hydrologic year type; (2) gage data and/or project operational data indicating the actual flows prior, during, and after the alleged deviation; and (3) a description of any operational changes for August 30 and September 16, 2021.*

**August 30, 2021 low flow event**

On August 30, 2021, McKay Station (part of the Ripogenus Project) tripped offline at 12:05 pm as a result of thunderstorms in the area. The 400 cfs minimum outage flow was restored to the river within 13 minutes via the station's minimum flow system, and then the normal 2,000 cfs whitewater recreation minimum flow was restored within approximately 3.5 hours. A courtesy notification of this event was distributed to resource agencies on August 31, 2021.

> Required flows – between May 1st and September 15th, Article 402 of the Ripogenus Project license requires that minimum whitewater recreation flows of between 2,000 and 2,300 cfs be released from the Project between 0830 and 1700 hrs. on a daily basis. In a "dry" hydrologic year (such as 2021), the required minimum flows are 2,200 cfs on Saturdays and Sundays, 2,000 cfs on Mondays and Fridays, and 1,800 cfs on Tuesdays through Thursdays.
>
> During other hours of the day outside of the whitewater release time period (i.e., 1700 to 0830 hrs.), Article 402 requires a minimum flow of 1,000 cfs from June 8th through October 14th. Additionally, Article 402 allows reduced "outage" minimum flows of 400 cfs when generating unit failures occur at McKay Station, "*with scheduled minimum flows to be resumed as quickly and practically as possible by releases from Ripogenus Dam if necessary, but in no event in more than three days following the initial outage*".

Finally, Article 402 states that "*These specified minimum flows shall be the minimum flows for each hourly period (measured on the basis of an hourly average)*".

Since August 30th was a Monday and 2021 is a "dry" hydrologic year, Article 402 required that a minimum whitewater recreation flow of 2,000 cfs be released during the 0830 to 1700 hr. time period when the station trip occurred.

Operational data – the attached charts show Ripogenus Project outflows prior to, during, and after the August 30 low flow event and alleged license deviation.

Operational changes – On the afternoon of August 30, 2021, several hydro stations on the West Branch of the Penobscot River tripped offline during and after thunderstorm activity, including McKay Station at 12:05 pm. An investigation determined that a damaged lightning arrestor caused the outage at McKay Station. The minimum outage flow was restored to the river within 13 minutes via the station's minimum flow system (which automatically provides an emergency outage flow of more than 400 cfs), and then the 2,000 cfs whitewater recreation minimum flow was restored by 3:30 pm. The Ripogenus outflow dropped to a low of 109 cfs during the event, while the lowest hourly average outflow was 640 cfs.

Summary – although GLHA provided a courtesy notification regarding the August 30 low flow event to resource agencies (see attached), GLHA determined that the event was not reportable to the Commission as an excursion from license requirements, since the hourly average outflow did not drop below the emergency outage flow of 400 cfs. Further, the automatic minimum flow system at McKay Station functioned as designed during the event, and GLHA was able to restore river flows in a timely fashion.

**September 16, 2021 low flow event**

On September 16, 2021, McKay Station tripped offline due to a Versant Power (local utility) line disturbance. Flow was restored to the river within 5 minutes via the station's minimum flow system, and then the normal 1,000 cfs minimum flow was restored within approximately 2.5 hours. A courtesy notification regarding this event was distributed to resource agencies on September 16, 2021.

Required flows – from September 16th through October 14th, Article 402 requires a minimum flow of 1,000 cfs, except higher minimum whitewater recreation flows are required on weekends from 0830 – 1700 hrs. through October 1st.

As indicated above for the August 30th event, Article 402 allows reduced minimum "outage" flows of 400 cfs during generating unit failures at McKay Station, and it specifies that an hourly average be used as a basis for license compliance.

Since September 16th was a Thursday, whitewater recreation flows were not required that day, and only the minimum flow was being conveyed at the time of the station trip.

Operational data - the attached chart shows Ripogenus Project outflows prior to, during, and after the September 16th low flow event and alleged license deviation.

Operational changes – at 7:31 am on September 16, 2021, all of GLHA's hydro stations on the Upper Penobscot (McKay; North Twin; Millinocket; Dolby; East Millinocket; Weldon) tripped offline due to a local utility (Versant Power) line disturbance. At McKay Station, the 400 cfs emergency outage flow was restored to the river within 5 minutes via the station's

minimum flow system, and then the 1,000 cfs minimum flow was restored by 9:58 am. The Ripogenus outflow dropped to a low of 118 cfs during this event, while the lowest hourly average outflow was 508 cfs.

Summary – as with the August 30 low flow event, a courtesy notification regarding the September 16th low flow event at Ripogenus was provided to resource agencies (see attached). However, GLHA determined that the event was not reportable to the Commission as an excursion from license requirements, since the hourly average outflow did not drop below the emergency outage flow of 400 cfs. Further, the automatic minimum flow system at McKay Station functioned as designed during the event, and GLHA was able to restore river flows in a timely fashion.

In summary, the two events detailed in TU's complaint were (1) created by unforeseeable events beyond GLHA's control; (2) corrected within 13 and 5 minutes, respectively; (3) resulted in minimum flow reductions too minimal and transitory to be considered license violations; and (4) nonetheless promptly reported as a courtesy to the relevant resource agencies.

The Commission's October 4th letter also requests that GLHA provide (1) any comments received from resource agencies or other interested parties regarding the flows on these dates, and GLHA's response, and (2) the maximum ramping rates that occurred on August 30 and September 16, 2021. GLHA received no comments from the resource agencies in reply to GLHA's courtesy notifications regarding the August 30 and September 16 low flow events, and no comments or questions were received from any other stakeholders (including TU). In addition, the Ripogenus FERC license does not require flow ramping, so minimum flows were re-established as quickly as possible (consistent with the Article 402 requirement to resume scheduled minimum flows *"as quickly and practically as possible")* after each low flow event as shown in the attached graphs.

Please e-mail me at kevin.bernier@brookfieldrenewable.com or call me at (207) 951-5006 if you have any questions or need additional information.

Sincerely,

Kevin Bernier

Kevin Bernier
Senior Compliance Specialist

Cc: N. Stevens, J. Cole, K. Maloney, M. Kessel, S. Michaud, S. Farrington, R. Dill, M. Osborne, T. Mapletoft, R. Dorman, L. Macomber, P. McNelis, P. Wainwright; GLHA
A. Burtner: FERC DHAC – Washington

GLHA File: HSSE 4a/2572/01

| | |
|---|---|
| **From:** | Bernier, Kevin |
| **To:** | Kathy Howatt (Kathy.howatt@maine.gov); Dunham, Kevin (Kevin.Dunham@maine.gov); Gallant, Kevin; Mark Caron (mark.caron@maine.gov); John Perry (john.perry@maine.gov); Sferra, Christopher; Bryan Sojkowski; Julianne Rosset (julianne_rosset@fws.gov); Tim Obrey (tim.obrey@maine.gov); Doug Kane (douglas.kane@maine.gov) |
| **Cc:** | Cole, James; Maloney, Kelly; Dill, Richard; Osborne, Michael; Kessel, Miranda; Michaud, Steve; Stevens, Nate; Mapletoft, Thomas; Farrington, Stephen; Macomber, Lance; Wainwright, Paul; McNelis, Patrick; Dorman, Randy |
| **Subject:** | Penobscot station trips |
| **Date:** | Tuesday, August 31, 2021 3:22:00 PM |
| **Attachments:** | image001.gif |

The North Twin and Millinocket hydro stations (both part of the Penobscot Mills Project) tripped offline during yesterday afternoon's thunderstorms when a breaker tripped. Following a downstream public safety check and activation of a siren alarm, system operators deflated the inflatable flashboard system at Stone Dam, thereby re-establishing the required 2,000 cfs minimum flow at Millinocket. Outflow from the Millinocket Development dropped to a low of about 175 cfs during this approximate 14-minute flow interruption.

Article 403 of the Penobscot Mills Project license requires in part that:

> *"The licensee shall operate the Millinocket, Dolby, and East Millinocket developments in a run-of-river mode while providing an instantaneous minimum flow of 2,000 cubic feet per second (cfs) to the West Branch of the Penobscot River at Millinocket, for the protection of water quality and aquatic habitat in the Penobscot River."*

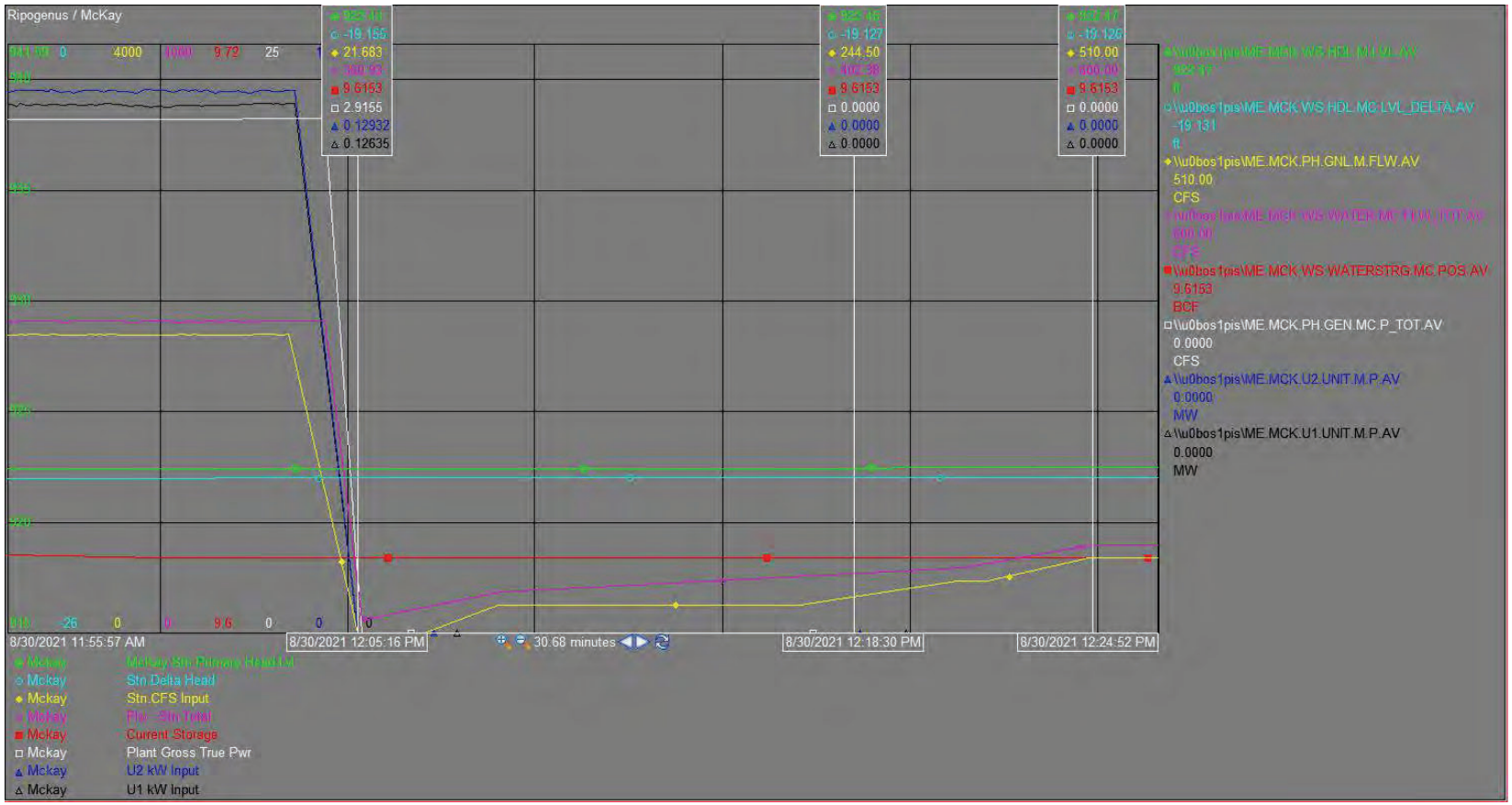
Just so you know, McKay Station (part of the Ripogenus Project) also experienced two brief station trips yesterday afternoon during the thunderstorms; however, flow was restored to the river within 15 minutes after each event via either the station's minimum flow system or by restarting a unit. The McKay Station trips are not reportable, since there was no excursion of the hourly average minimum flow requirement.

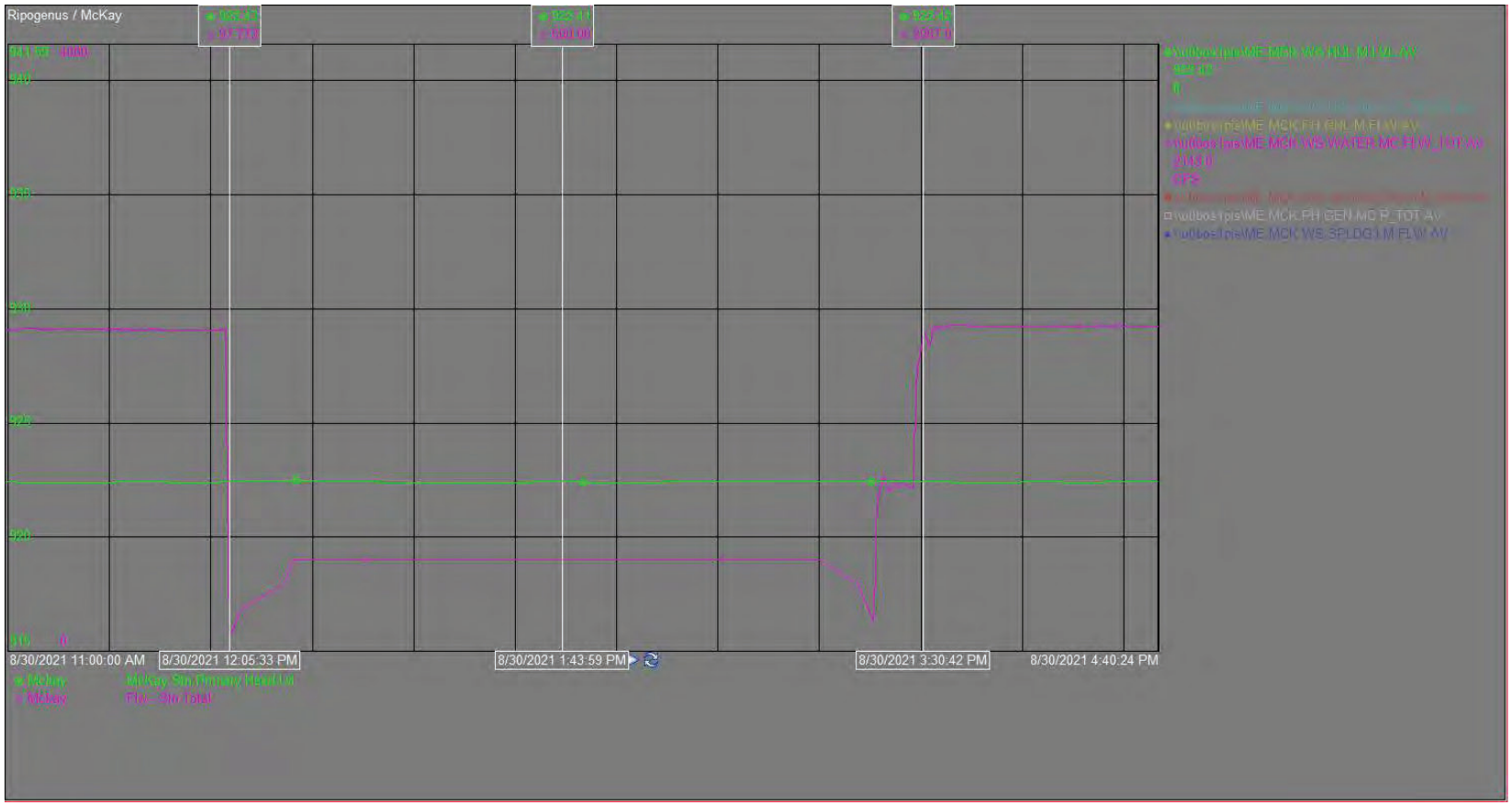
Great Lakes Hydro America, LLC is still investigating the definitive causes for these station trips, but at this point they appear to be weather-related. I will copy you on the final report to FERC, but in the meantime, please let me know if you have any questions or concerns.

**Kevin Bernier**
Senior Compliance Specialist

**Brookfield Renewable**
1024 Central Street, Millinocket, ME 04462
**C** 207 951 5006
kevin.bernier@brookfieldrenewable.com
www.brookfieldrenewable.com

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Ripogenus / McKay
8/30/2021 11:55:57 AM
8/30/2021 12:05:16 PM
30.68 minutes
8/30/2021 12:18:30 PM
8/30/2021 12:24:52 PM
Mckay Stn Delta Head
Mckay Stn.CFS Input
Mckay Current Storage
Mckay Plant Gross True Pwr
Mckay U2 kW Input
Mckay U1 kW Input
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Ripogenus / McKay
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8/30/2021 3:30:42 PM
8/30/2021 4:40:24 PM

| | |
|---|---|
| **From:** | Bernier, Kevin |
| **To:** | Kathy Howatt (Kathy.howatt@maine.gov); Dunham, Kevin (Kevin.Dunham@maine.gov); Gallant, Kevin; Mark Caron (mark.caron@maine.gov); John Perry (john.perry@maine.gov); Sferra, Christopher; Bryan Sojkowski; Julianne Rosset (julianne_rosset@fws.gov); Tim Obrey (tim.obrey@maine.gov); Doug Kane (douglas.kane@maine.gov); Casey Clark (casey.clark@maine.gov); Sean M Ledwin - Maine Department of Marine Resources (Sean.M.Ledwin@maine.gov); Mitch Simpson (Mitch.Simpson@maine.gov); Jeff Murphy (Jeff.Murphy@noaa.gov); Donald Dow (Donald.Dow@noaa.gov); Gail Wippelhauser, Ph. D. (gail.wippelhauser@maine.gov) |
| **Cc:** | Cole, James; Maloney, Kelly; Dill, Richard; Osborne, Michael; Kessel, Miranda; Michaud, Steve; Stevens, Nate; Mapletoft, Thomas; Farrington, Stephen; Macomber, Lance; Wainwright, Paul; McNelis, Patrick; Dorman, Randy; Brochu, Robert |
| **Subject:** | Upper Penobscot system wide outage |
| **Date:** | Thursday, September 16, 2021 8:08:00 PM |
| **Attachments:** | ~~image002.gif~~ |

This morning at 07:31 hrs, all of Brookfield's hydro stations on the Upper Penobscot (McKay; North Twin; Millinocket; Dolby; East Millinocket; Medway; Weldon) tripped offline due to a Versant Power line disturbance. Brookfield crews have been busy all day getting the stations back online and restoring river flows as soon as practicable after making public safety checks downstream. These station trips caused disruptions in run-of-river flows at the Medway Project (FERC No. 2666) and at the Millinocket, Dolby, and East Millinocket Developments (Penobscot Mills Project, FERC No. 2458). The trip of the Millinocket Hydro Station also resulted in an estimated 15-minute deviation from that Development's 2,000 minimum flow requirement, while the trip of Weldon Station resulted in an approximate 42 minute deviation from the Mattaceunk Project's 1,674 cfs minimum flow condition. As of 13:50 hrs this afternoon, all of the stations are back online, and normal operations have resumed.

Article 403 of the Penobscot Mills license states in part that:

> "*The licensee shall operate the Millinocket, Dolby, and East Millinocket developments in a run-of-river mode while providing an instantaneous minimum flow of 2,000 cubic feet per second (cfs) to the West Branch of the Penobscot River at Millinocket, for the protection of water quality and aquatic habitat in the Penobscot River. The licensee shall at all times act to minimize the fluctuation of the reservoir surface elevations by maintaining a discharge from each of these developments so that, at any point in time, flows, as measured immediately downstream from the tailraces of the developments, approximate the sum of the inflows to the project reservoir. Run-of-river operation or minimum flows may be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods upon mutual agreement between the licensee, the U.S. Fish and Wildlife Service, and the Maine DEP. If the run-of-river operation or minimum flow is so modified, the licensee shall notify the Commission as soon as possible, but no later than 10 days after each such incident*."

Article 402 of the Medway Project license (as amended on April 18, 2005) states:

> "*The licensee shall operate the project in a run-of-river mode to protect aquatic life and water quality in the West Branch Penobscot River. The licensee shall at all times act to minimize reservoir surface elevation fluctuation by maintaining project discharge so that, at any point in time, flows immediately downstream from the project dam approximate flows into the project reservoir. The licensee shall maintain an impoundment surface elevation*

*within six inches of 260.3 feet above mean sea level (msl) except during emergency, maintenance, and high or low flow events beyond the licensee's control, following flashboard failures. Following flashboard failures, the licensee shall maintain the impoundment level within six inches of the spillway crest and shall replace the flashboards as soon as safely possible.*

*Run-of-river operations may also be modified for short periods upon mutual agreement between the licensee and the Maine Department of Environmental Protection (DEP). The licensee shall notify the Commission as soon as possible, but no later than 10 days after each incident resulting in a change in run-of-river conditions as specified above*."

Article 403 of the Mattaceunk Project license in part states:

"*In addition to implementing the impoundment level requirements of Maine Department of Environmental Protection's (Maine DEP) condition A (Appendix A) and minimum flow requirements of Maine DEP's condition B (Appendix A), the licensee must operate the Mattaceunk Project in a run-of-river mode with year round use of the 4-foot-high flashboards such that average daily outflow approximates average daily inflow*."

"*For unplanned deviations lasting 3 hours or less that do not result in visible environmental effects, the licensee must file an annual report, by March 1, describing each incident that occurred during the prior January 1 through December 31 time period*."

Condition B of the Maine DEP Water Quality Certification for the Mattaceunk Project states in part:

*"Except as temporarily modified by: 1) approved maintenance activities, 2) extreme hydrologic conditions 3) emergency electrical system conditions, or 4) agreement between the Applicant, the Department, and state and/or federal agencies as appropriate, a total minimum flow of 1,674 cfs or inflow, whichever is less, and a daily average minimum flow of 2,393 cfs from July 1 through September 30 or 2,000 cfs from October 1 through June 30, shall be released from the Project to protect downstream fish and aquatic resources, unless inflow is less than the stated daily average minimum flows, in which case outflow from the Project would equal the inflow to the Project*."

As indicated above, McKay Station (part of the Ripogenus Project) also tripped offline during this event; however, the 400 cfs emergency outage flow was restored to the river within 5 minutes via the station's minimum flow system, and then the normal 1,000 cfs minimum flow was restored by 09:58 hrs. Thus, the McKay Station trip is not reportable to FERC, since there was no excursion of the Project's hourly average minimum flow requirements.

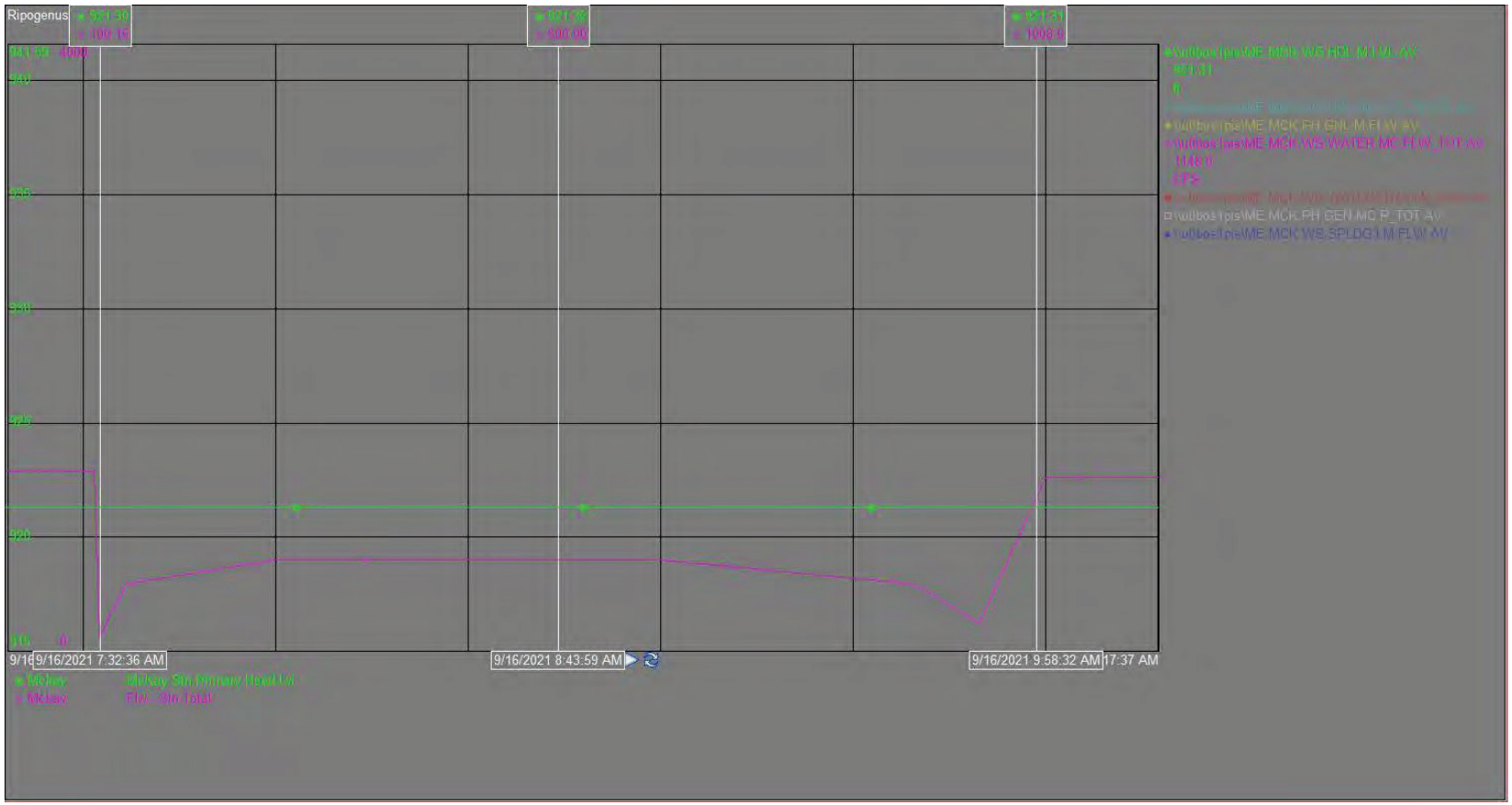
GLHA is still investigating and collecting information on this event, which will be detailed in a report to FERC within 10 days. I will copy you on this report, but in the meantime please let me know if you have any comments or questions.

**Kevin Bernier**
Senior Compliance Specialist

**Brookfield Renewable**
1024 Central Street, Millinocket, ME  04462
**C** 207 951 5006
kevin.bernier@brookfieldrenewable.com
www.brookfieldrenewable.com



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Ripogenus
9/16/2021 7:32:36 AM
9/16/2021 8:43:59 AM
9/16/2021 9:58:32 AM

,

VIA ELECTRONIC FILING October 28, 2021

Ms. Kimberly D. Bose,
Secretary Federal Energy Regulatory
Division 888 First Street, N.E.
Washington, D.C. 20426

Re: Response to MDIFW Comments and Study Requests for the Ripogenus Hydroelectric Project (FERC No. 2572-133) and Penobscot Mills Hydroelectric Project (FERC No. 2458-247) filed on October 8, 2021

Dear Secretary Bose:

I worked for then GNP; and later the licensee, GLHA, from 1977-2002 as a fisheries biologist with my primary responsibly being West Branch of the Penobscot River (WB) drainage data collection and analysis, coauthoring Big A, Ripogenus, Penobscot Mills, and the Storage Project FERC applications and supervising enhancement and mitigation measures. My colleagues and I collected the historical fisheries data so often referenced in the subject proceedings. These (1980s) data are antiquated and should NOT be used to base decisions that will remain in effect for 30 years.

My comments are directed to the Department of Inland Fisheries and Wildlife's (MeDIFW) October 8, 2021 comments and study request's filing. While I generally agree and support goals expressed, I have issues with MeDIFW's focus. The licensing of the above referenced projects is an evidentiary proceeding. Without substantial date collections, before (1980s) and current/after (2022) fisheries comparison will be impossible. Most alarming is MeDIFW's willingness to accept historic angler use and salmonid growth and catch data. MeDIFW makes this statement despite asserting that *"there has been a significant change in the quality of the landlocked salmon fishery in both locations*". Neither the licensee nor MeDIFW have collected quantifiable WB riverine fisheries information in the last ten plus years despite significant changes in water management.

I have listed six (6) topics of concern below along with the relevant MeDIFW comment(s) and my response(s)

1) "*MDIFW concurs with the Licensee that there is an extensive history of inland fisheries studies associated with the Ripogenus Project completed in preparation for the 1996 license, and The Maine Department of Inland fisheries and Wildlife's (MeDIFW) comment "extensive histories of inland Fisheries studies … in preparation for the 1996 license "..."and the need to duplicate these (old) studies makes little biological sense*."

MeDIFW concurrence with the licensee makes little sense. If only for management purposes, after a forty year data hiatus, requiring new studies of the all WB waters is a logical conclusion. The river below McKay Station is one of Maine's premier fisheries with regional and national significance. The referenced studies (used in the 1992 license application) were at a minimum nine years old in 1996 and now approach 40 years old; inadequate even for future fisheries management purposes e.g., bag and size limits, terminal gear restrictions. Technology and collection methods have been greatly improved. Project operations below McKay Station have been drastically altered due to peaking operations, extreme impoundment drawdowns, many minimum flow (1100 cfs) events and some "outage" flows. The degree of fish and aquatic community degradation needs to be identified. There is a huge 40 year data gap. Repeating historical salmonid West Branch (McKay to Dolby Stations) studies and determining current population levels will determine if, in fact, there have been changes. "Repeating historic studies" (using current technology) is exactly what FERC must require.

1a) *"…there has been a significant change in the quality of the landlocked salmon fishery in both (impoundment and river ..ed) locations.*

While I concur with this general statement, for the WB below McKay Station this comment requires some supporting factual data. Other than some volunteer (biased) 'angler survey' boxes results and antidotal reports, no data exists. While MeDIFW and the Greenville region has demonstrated extreme competence (note Moosehead Lake, [FERC P-2671] fishery successes), subjective judgement is not acceptable. FERC must require quantifiable angler use and catch and salmonid growth and survival data. Without current, quantifiable fisheries data, interested parties will be unable to comment and FERC will not be able to make an informed 30-year licensing decision.

MeDIFW was silent on the declines in lake white fish (Coregonus clupeaformis) populations in the Ripogenus impoundment. The status of burbot (Lota lota) is not mentioned. Both species provide popular fisheries in nearby lakes and are vulnerable to extreme drawdowns during and after spawning (note: burbot spawn in the confluence of the upper West Branch).

2)"… *these studies need not be duplicated unless there are identified data gaps, changes in operation that may Impact the fisheries resources*."

As noted above, project operations have been drastically changed (without archival ***hourly flow*** and lake level data, it is impossible for MeDIFW or other interested parties to know the degree of change). Relatively stable flows are gone, replaced by peaking operation. The licensee (but not necessarily MeDIFW) was well aware of the impact of peaking when it filed the PAD as it sponsored (peaking and ramping) studies on the Magpie and Batchawana Rivers (Ontario, CA). If they doubt their own studies, the literature is replete with supporting literature

**3)** *"….review and fine tune the water management for the Ripogenus Project*"

MeDIFW suggests "fine tune the water management for the Ripogenus Project". "Water management" used in conjunction with the Ripogenus Project is an oxymoron. There has been no water management. The current operation is generate and drain. The Ripogenus impoundment storage has been drawn down and managed solely for market driven power generation. "More than fine tune", FERC needs require a (peer reviewed) water management plan that benefits public users (anglers, boaters, camp owners) native Americans and all aquatic and terrestrial resources.

**3a)** *Flow changes of less than 25% per hour (ramping rate) can mitigate impacts from peaking power*.

I concur with MeDIFW's suggestion of ramping during peaking operations but it is too limited. Both up and down ramping rates are equally important in mitigating (peaking) impacts. In fact, the Licensee's Storage Project P-2634, 401 WQC requires a ramping plan. "The applicant shall develop and implement a plan to ramp flows down in Caucomgomoc Stream prior to the required flow reduction to 35 cfs on June 7, in order to prevent stranding of aquatic organisms." Most recent FERC licenses contain ramping prescriptions, often developed from instream studies. The

area in the one mile reach immediately below McKay Station features steep walls and high gradients and is "flow sensitive". It also the area salmon now (post peaking) appear to favor during July and August and an area dominated by hydropsychid caddis (the major salmonid "summer" food source). The combination of the above factors clearly dictates a need for study rather than generic prescriptions. FERC must include (for all facilities) the same ramping prescriptions (based on instream flow study results) as contained in other FERC licensed peaking projects.

**(4)** *"The decline in salmon growth is related primarily to a surplus of salmon in the impoundment and resulting lack of smelt, the primary forage fish".*

I concur with the "decline in salmon growth" (and condition) but not necessarily the reason(s) for the "lack of smelt". If fact, the "lack of smelt" has not been quantified as no (smelt) sampling e.g., trawls, gill nettings, has, to my knowledge, been undertaken in the Ripogenus or other impoundments. MeDIFW assumes this to be a predator (salmon)/prey (smelt) imbalance. While this is possible, other possibilities exist, including loss/shifting of littoral areas, a shift in the zooplankton community, and/or a shift in the smelt age distribution structure. The smelt biomass may be stable but there may have been change in the age structure (more bigger smelt). Agency and NGO study requests should, when implemented, clarify problems with smelt and plankton communities provided Normandeau Associate's 1981 studies (see Big A, FERC P-3779) are used as baseline.

**(5)** **"***It has been well-documented that the smelt drift in the river is important to salmon growth for the riverine population*."

I agree that smelt drift is important, in fact it is critical, to meeting riverine (WB) salmon management goals. While smelt drift below McKay Station has (apparently) declined, MeDIFW's statement is based on fragmentary data. There is a need to document volume and seasonality of the current export/drift of smelt though McKay, North Twin, Millinocket and Dolby Stations. These data are needed to identify present smelt availability (as forage) as well as future (MeDIFW) fisheries management and flow goals. These collections should not be *the responsibility of MeDIFW.*

**(6)** *The Licensee and MDIFW have verified the presence of young wild salmon and brook trout in the (Holbrook side) channel. We simply request that the Licensee*

*continue to operate and maintain the Holbrook Side Channel as outlined in the current license (article 406).*

MeDIFW's request to continued operations in is not enough. The licensee has demonstrated its inability to comply with a litany of license articles, including the Holbrook bypass. In the late 1990's, I conducted the initial survey of the watered Holbrook Side Channel and confirmed the production of juvenile salmon (young-of-the year, parr). This enhancement measure was a success. This year (2021), I visited the "side channel" on several low flow occasions. My professional judgement is that juvenile salmon habitats are seriously degraded, if not eliminated, during low flow events. Salmon production goals are lost under outage flow events. A "continuation" of present operations with low flows e.g., 1100 cfs, is not acceptable. Annual monitoring the Holbrook side channel should be resumed. FERC must ensure Article 406 measures are guaranteed in the future.

The licensing of the Ripogenus and Penobscot Mills Projects will result in a 30 year license. Resource agencies and stakeholders have requested studies that will provide FERC with information necessary to "balance" power and non-power interest. The licensee's contention is that "only data gaps" need to be fill-in, is baseless. The licensee's presented outdated, 30-40 year old studies conducted prior to change to peaking operations as a substitute to any onsite presence. The absence of any "recent" data demonstrates the need for current state -of-the-art fisheries and aquatic communities studies. FERC should reject any reliance on 40 year old data, and require studies suggested by the agencies and NGOs. The burden of proof as to the health of all projects' fisheries and aquatic communities falls on the licensee.

Thank you for the opportunity to respond

Contact info;

Ed Spear
307 Mt Hope Ave
Bangor, Me 04401
Phone: 207-217-4288
Email: edspear1@yahoo.com

Kimberly D. Bose November 9, 2021
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

RE: Ripogenus Project FERC No. P-2572-133
Study Request; Creel Survey, West Branch of the Penobscot River

Study Request; Conduct a creel survey and determine daily and annual West Branch of the Penobscot River angler use, effort, catch, method (drift boat, watercraft, wading, etc.) and (riverine) location of anglers fishing between Ripogenus Dam and the base of Pockwockamus Falls

A creel survey is a standard method for determining angler use and catch from one or more waters. Typically a clerk, either stationary or mobile, counts and when possible, interviews anglers during predetermined dates and times. On-site counts (and interviews) are more practical and robust than other possible methods such as aerial, on-site volunteer (angler) boxes with "fill-in" forms or "mail-in" surveys. Creel surveys, as described above, are commonly used by MeDIFW and fisheries agencies across the country.

In reading comments, and study plan requests, I have seen no such requests for a West Branch of the Penobscot River (WB) creel survey. Such a study of angler use, catch and effort lays the foundation for future licensing decisions making as well as supporting current/future State of Maine fisheries management goals. The Maine Department of Inland Fisheries and Wildlife (MeDIFW) recently (November 2, 2021) filed a (draft) *FISHERIES STRATEGIC PLAN 2021-2035, Vol I (*MeDIFW Plan) that listed prioritized fisheries goals. General fisheries goals include "… Maintain healthy fish populations and their habitat. Ensure freshwater fish populations remain healthy and are sustainably managed into the future." In order to obtain the MeDIFW Plan's primary goals, a number of secondary actions are required;

"Conserve native fish species, particularly those exhibiting population decline, …"

"Manage for sustainable harvest of sport fish"

"Promote and direct conservation actions, including conservation of riparian habitat, habitat restoration, and habitat connectivity targeting the state's highest priority wild native fisheries". Brook trout and landlocked salmon are two of the native fish species referenced in the MeDIFW's Plan. (Emphasis added)

- *1.Describe the goals and objectives of each study proposal and the information to be obtained;*

  The goal of the proposed study is to record existing WB angler use (date, time, location(s) fished and terminal gear), and catch (species, size and number). Angler use and catch presented by the licensee in the riverine areas below Ripogenus Dam is outdated. Current (daily/annual) angler use and catch needs to be enumerated and then evaluated.

  The licensee states in the PAD that the existing body of (fisheries) information is adequate and that no new information is required. The referenced PAD fisheries studies are, at a minimum 35 years old and do not reflect changes in project operations. In order to compare (1980s) baseline conditions described in the 1992 EIS, current (2022) angler use and catch information is necessary. In addition to providing critical fisheries information to all interested parties, a creel survey will meet goals described in the (draft) MeDIFW Plan. In regard to Landlocked Atlantic Salmon (salmon), these goals include;

  • Advocating for in-watershed land and water management practices that maintain or enhance spawning and rearing habitats for wild populations, where populations are not overabundant
  • Continue current monitoring and assessment to be responsive to changes in abundance and condition over time
  • Reevaluate salmon waters that haven't been recently assessed to ensure existing regulations reflect current management goals and angler behavior. (Emphasis added)

- 2*. If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;*

There is no current (quantifiable) WB fisheries information on which sound management decisions can be based. A creel survey of the West Branch fisheries (salmon, brook trout) below Ripogenus Dam and extending downstream to Pockwockamus Falls will meet goals (see above) put forth in the (draft) MeDIFW Plan.

- *3. If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study*;

  I am a (retired) private individual who worked for then GNP and was responsible for (WB) fisheries study designs, data collection and analysis, and coauthored the 1992 Ripogenus FERC License application. I had oversight of the Holbrook Nursey Channel enhancement measure (Article 406). I remain interested in the WB fish and aquatic communities and fish there frequently.

  Study results will improve MeDIFW fisheries management options e.g., length of season, increased/decreased catch and length limits, thus are very much in the public interest. A return to the fishery conditions of 1980's will benefit the local economy and as well as local, regional and national anglers.

- 4*. Describe existing information concerning the subject of the study proposal, and the need for additional information*;

  <u>There is NO existing WB fisheries (creel survey) study proposal</u>, thus this is NOT an additional information request. Studies provided by the licensee are PRE-Peaking and thus, irrelevant. There is no current (quantifiable) fisheries information for the WB between Ripogenus Dam and the base of Pockwockamas Falls. Critical data gaps exist for angler use, catch, and (riverine) location and for salmon and brook trout (trout) growth, survival and spawning history.

- *5. Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements*;

  The Licensee has dramatically changed project operations from a relatively stable base flow to a peaking operation. The changes have had a devasting impact on angler use and salmon growth, abundance, choice of habitat and movement (personal observations). When compared to the baseline data used in the EIS, 2022-2023 WB creel surveys will demonstrate changes in

angler use and effort and salmon and trout abundance (catch rates) and to a lesser degree, choice of habitat and movement. (NOTE: Condition (factors) and growth rates will be provided by some yet to be determined collection method e.g., electrofishing, seining, gill netting, etc.)

- 6. *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate filed season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge;*

  The proposed creel survey should duplicate the 1978 study plans developed by MeDIFW (Greenville Region) and Great Northern Paper (GNP). As the EIS is based on GNP's 1979-1988 creel survey results, the suggested study and methodology should be acceptable to FERC and participating parties. These methods are fully described in Appendix IX p-183 of the FERC Ripogenus Project License Application.

  For the level of information desired, angler surveys should occur;

  May and September – four (10h) days, ending at sunset

  June -August – four (12h) days, ending a half hour after sunset

  Sampling days should be divided between weekdays and weekend/holidays

  I assume that the Licensee has retained a copy of the GNP computer program designed to input daily angler, use, catch and effort based on stratified random sampling.

7. *Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs*.

Cost $35,000

No alternative WB creel survey (or study) of angler use and catch has been presented. The licensee has stated 35 year-old data collected during historical "relatively stable" base flows is comparable to existing peaking operations and the resulting periodic minimum flows e.g. 1100 cfs. There are

no fisheries data or literature references that supports the licensee's statements. In fact, there is antidotal evidence and peer reviewed literature to the contrary.

The licensee argues that present operations are maintaining the fisheries at 1980's levels. A creel survey(s) will either refute or confirm the licensee's assertions. Data collection will also meet goals set forth in the (draft) MeDIFW Plan. The burden of proof falls on the licensee.

Contact information

Ed Spear
307 Mt Hope Ave
Bangor, Me 04401
Phone: 207-217-4288

FEDERAL ENERGY REGULATORY COMMISSION
Washington, DC 20426
November 22, 2021

OFFICE OF ENERGY PROJECTS

Project Nos. 2572-133 & 2458-247 –
Maine
Ripogenus Hydroelectric Project
Penobscot Mills Hydroelectric Project
Great Lakes Hydro America, LLC

**VIA FERC Service**

**Reference: Scoping Document 2 for the Ripogenus Hydroelectric Project (P-2572-133) and Penobscot Mills Hydroelectric Project (P-2458-247)**

To the Parties Addressed:

The Federal Energy Regulatory Commission (Commission) is currently reviewing the Pre-Application Document (PAD) submitted by Great Lakes Hydro America, LLC (GLHA), a subsidiary of Brookfield Renewable, for relicensing the Ripogenus Hydroelectric Project (FERC No. 2572) and the Penobscot Mills Hydroelectric Project (FERC No. 2458) (collectively referred to as the "Projects"). The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot Counties, Maine. The Projects do not occupy any federal land.

Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended, Commission staff will prepare an environmental document (NEPA document) which will be used by the Commission to determine whether, and under what conditions, to issue a new license for the Projects. To support and assist our environmental review and determine the level of analysis needed, we are beginning the public scoping process to ensure that all pertinent issues are identified and analyzed, and that the NEPA document is thorough and balanced.

Our preliminary review of the environmental issues to be addressed in our NEPA document was contained in Scoping Document 1 (SD1), which was issued on August 10, 2021. We requested comments on SD1 to hear the views of all interested

agencies and entities on the scope of issues that should be addressed in the NEPA document. Due to restrictions on mass gathering related to COVID-19, Commission staff was unable to conduct any on-site scoping meetings or an on-site environmental site review. Rather, two virtual scoping meetings and a virtual environmental site review were held. Based on comments these scoping meetings and site review, and written comments that have been filed, we have updated SD1 in the enclosed Scoping Document 2 (SD2) to reflect our current view of issues and alternatives to be considered in the NEPA document. ***Key changes from SD1 to SD2 are identified in bold and italicized type***.

SD2 is being distributed to GLHA's distribution list and the Commission's official mailing list (*see* section 7.0, *Mailing Lists*, of the attached SD1). If you wish to be added to, or removed from, the Commission's official mailing list, please send your request by email to Mailto:FERCOnlineSupport@ferc.gov, or via U.S. Postal Service mail to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 888 First Street NE, Room 1A, Washington, DC 20426. Submissions sent via any other carrier must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 12225 Wilkins Avenue, Rockville, Maryland 20852. All written or emailed requests must specify your wish to be added to, or removed from, the mailing list, and must clearly identify **Ripogenus Hydroelectric Project (P-2572-133)** and/or **Penobscot Mills Hydroelectric Project (P-2458-247)** on the first page.

The enclosed SD2 supersedes SD1. SD2 is issued for informational use by all interested parties; no response is required. If you have any questions about SD2, the scoping process, or how Commission staff will develop the NEPA document for the Projects, please contact Allan Creamer at (202) 502-8365, or at allan.creamer@ferc.gov. Additional information about the Commission's licensing process and the Projects may be obtained from the Commission's website, www.ferc.gov.

Enclosure: Scoping Document 2

# SCOPING DOCUMENT 2

**RIPOGENUS HYDROELECTRIC PROJECT**
**(FERC NO. 2572-133)**
**PENOBSCOT MILLS HYDROELECTRIC PROJECT**
**(FERC NO. 2458-247)**




Federal Energy Regulatory Commission
Office of Energy Projects
Division of Hydropower Licensing
Washington, DC

November 2021

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# SCOPING DOCUMENT 2

## Ripogenus Hydroelectric Project (FERC No. 2572-133)
## Penobscot Mills Hydroelectric Project (FERC No. 2458-247)

## 1.0 INTRODUCTION

The Federal Energy Regulatory Commission (Commission or FERC), under the authority of the Federal Power Act (FPA),[1] may issue licenses for terms ranging from 30 to 50 years for the construction, operation, and maintenance of non-federal hydroelectric projects. On June 11, 2021, Great Lakes Hydro America, LLC (GLHA), filed notices of intent and a pre-application document (NOI/PAD) for new licenses for the Ripogenus Hydroelectric Project No. 2572-133 (Ripogenus Project) and the Penobscot Mills Hydroelectric Project No. 2458-247 (Penobscot Mills Project) (collectively, the "Projects"). The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot Counties, Maine (figure 1). A detailed description of the Projects ***and the Projects' operation*** is provided in section 3.0, *Proposed Actions and Alternatives*. The Projects do not occupy federal lands.

The National Environmental Policy Act (NEPA) of 1969,[2] the Commission's regulations, and other applicable laws require that we independently evaluate the environmental effects of relicensing the Projects as proposed, and consider reasonable alternatives to the proposed actions.[3] We will prepare an environmental document (NEPA document) that describes and evaluates the probable effects, if any, of the licensee's proposed actions for the Projects and alternatives to the proposed actions. The Commission's scoping process will help determine the required level of analysis and satisfy the NEPA scoping requirements, irrespective of whether the Commission issues an environmental assessment (EA) or an environmental impact statement (EIS).

[1] 16 U.S.C. § 791(a)-825(r).

[2] 42 U.S.C. §§ 4321-4370(f).

[3] The Council on Environmental Quality (CEQ) issued a final rule on July 15, 2020, revising the regulations under 40 C.F.R. Parts 1500 – 1518 that federal agencies use to implement NEPA (*see* Update to the Regulations Implementing the Procedural Provisions of the National Environmental Policy Act, 85 Fed. Reg. 43,304). The Final Rule became effective on, and applies to any NEPA process begun after, September 14, 2020. Commission staff intends to conduct its NEPA review in accordance with CEQ's new regulations.

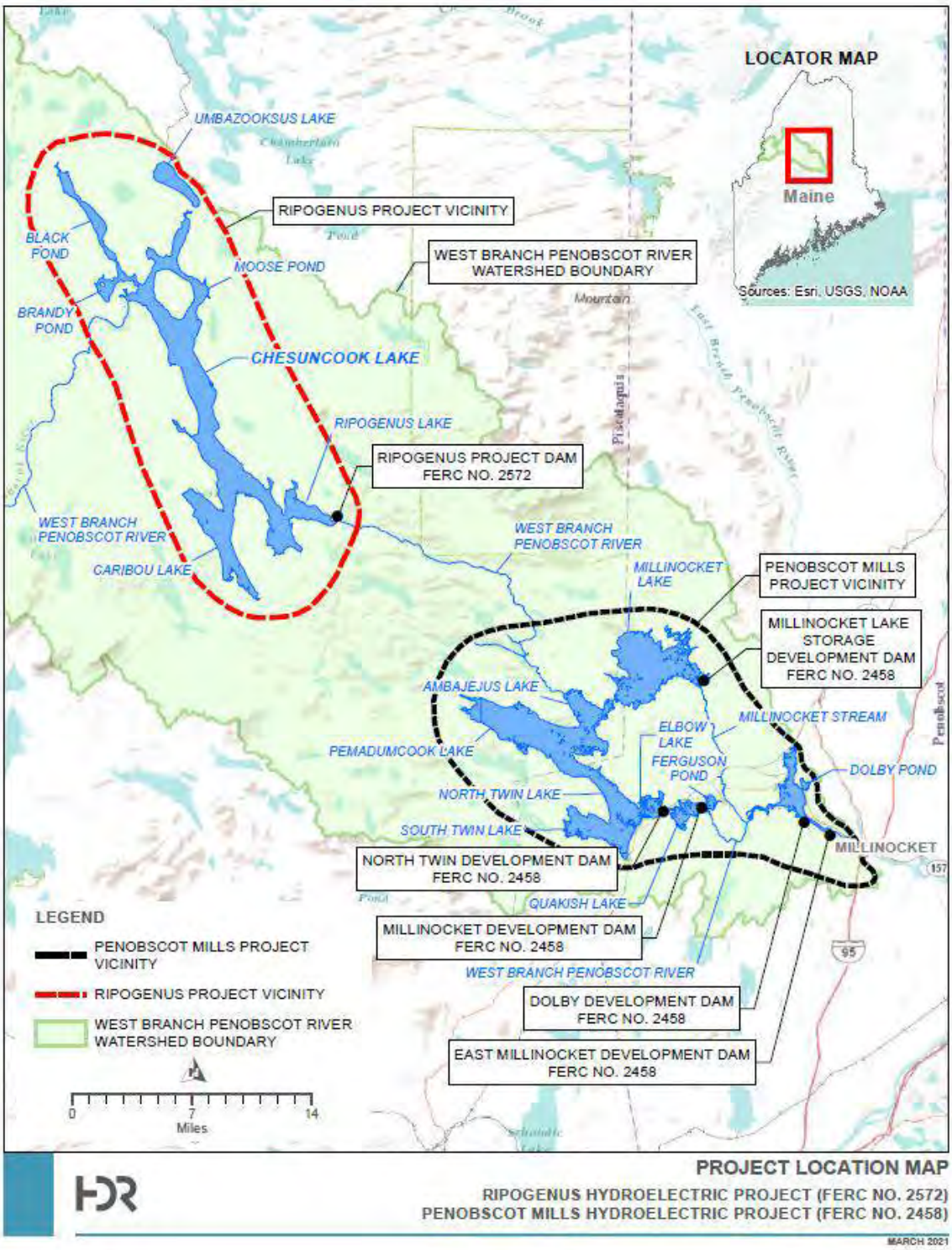



Figure 1. Location of the Ripogenus and Penobscot Mills Hydroelectric Projects (source: PAD).

# 2.0 SCOPING

This Scoping Document 2 (SD2) is intended to advise all participants as to the proposed scope of the NEPA document and to seek additional information pertinent to this analysis. This document contains: (1) a description of the scoping process and ***schedule for developing*** the license applications ***and NEPA document***; (2) a description of the licensee's proposed actions and alternatives to the proposed actions; (3) a preliminary identification of environmental issues ***and proposed studies***; (4) ***a proposed outline for the NEPA document;*** and (5) a preliminary list of comprehensive plans that are applicable to the Projects.

## 2.1 PURPOSES OF SCOPING

Scoping is the process used to identify issues, concerns, and opportunities for enhancement or mitigation associated with a proposed action. According to NEPA, the process should be conducted early in the planning stage of the project. The purposes of the scoping process are as follows:

- invite participation of federal, state, and local resource agencies, Native-American Tribes, non-governmental organizations (NGOs), and the public to identify significant environmental and socioeconomic issues related to the proposed Projects;

- determine the resource issues, depth of analysis, and significance of issues to be addressed in the NEPA document;

- identify reasonable alternatives to the proposed actions that should be evaluated in the NEPA document;

- Solicit***, from participants,*** available information on the resources at issue; and

- determine the resource areas and potential issues that do not require detailed analysis during review of the Projects.

## 2.2 SCOPING COMMENTS

Commission staff issued Scoping Document 1 (SD1) on August 10, 2021, to enable resource agencies, Native-American Tribes, NGOs, and the public to more effectively participate in, and contribute to, the scoping process. In SD1, we requested clarification of preliminary issues concerning the Projects and identification of any new issues that needed to be addressed in the NEPA document. Due to restrictions on mass

gatherings related to Novel Coronavirus Disease (COVID-19), Commission staff was unable to conduct any on-site scoping meetings and participate in any in-person environmental site review. Instead, on September 9, 2021, we conducted virtual scoping meetings and GLHA conducted a virtual environmental site review. The scoping meetings were transcribed by court reporter(s). We also solicited written comments, recommendations, and information on SD1.

We revised SD1 following the scoping meetings and after reviewing comments filed during the scoping comment period, which ended October 9, 2021. SD2 presents our current view of issues to be considered in the NEPA document. ***To facilitate review, key changes from SD1 to SD2 are identified in bold, italicized type***.

In addition to comments received at the virtual scoping meetings, the following entities filed written comments on the PAD or SD1.[4]

| **Entity** | **Date Filed**[5] |
|---|---|
| Maine Historic Preservation Commission | July 20, 2021 (by GLHA) |
| Stephen Condren | August 18, 2021 |
| Maine Natural Areas Program | August 30, 2021 |
| Maine Historic Preservation Commission | September 6, 2021 |
| Amanda Swanberg | September 10, 2021 |
| Tom Janelle - *Ripogenus only* | September 23, 2021 |
| Benjamin Koehler | September 23, 2021 and October 8, 2021 |
| Karl Koehler | September 23, 2021 |
| Joshua Firmin | September 23, 2021 |
| Alec Jansujwicz | September 23, 2021 |
| James Lepage – *Ripogenus only* | September 28, 2021 |

[4] The National Marine Fisheries Service (September 13, 2021), the U.S. Fish and Wildlife Service (September 14, 2021), the Maine Councill of Trout Unlimited (September 16, 2021), as well as the Maine Department of Marine Resources and the Maine Department of Inland Fisheries and Wildlife (both on September 17, 2021) filed requests for an extension of time to file comments and study requests. GLHA filed responses to the requests on September 17 and 24, 2021. On September 28, 2021, Commission staff denied the request for extension of time.

[5] The due date for comments and study requests was Saturday, October 9, 2021. Given that the due date fell on a weekend, and the following Monday was a federal holiday (Indigenous Peoples Day), the official filing deadline was Tuesday, October 12, 2021.

| | |
|---|---|
| Charles Paone, Jr. – *Ripogenus only* | September 29, 2021 |
| GLHA | September 30, 2021 |
| Jeffrey Scott Murphy | October 1, 2021 |
| Edward Spear | October 1 and 12, 2021 and November 15, 2021 |
| Owen Genest – *Ripogenus only* | October 5, 2021 |
| Ryan Gerry – *Ripogenus only* | October 5, 2021 |
| GLHA | October 5, 2021 |
| Peter Forti | October 7, 2021 |
| U.S. Fish and Wildlife Service (FWS) | October 7, 2021 |
| Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association – *Ripogenus only* | October 7, 2021 |
| Kathleen Houston – *Ripogenus only* | October 7, 2021 |
| Jeff Fayle – *Ripogenus only* | October 7, 2021 |
| Earle Fayle – *Ripogenus only* | October 7, 2021 |
| Michael Forti – *Ripogenus only* | October 7, 2021 |
| Andrew Taber – *Ripogenus only* | October 7, 2021 |
| Wesley Zemrak | October 7 and 8, 2021 |
| Allagash Gateway Campground – *Ripogenus only* | October 7, 2021 |
| Alexandra Horne | October 7, 2021 |
| Commission staff | October 8, 2021 |
| American Whitewater and Appalachian Mountain Club | October 8, 2021 |
| Paul Johnson - *Ripogenus only* | October 8, 2021 |
| Emelie Ferland – *Ripogenus only* | October 8, 2021 |
| Jacob Risch – *Ripogenus only* | October 8, 2021 |
| National Maine Fisheries Service (NMFS) | October 8, 2021 |
| Michael Smith | October 8, 2021 |
| Maine Department of Inland Fisheries and Wildlife (Maine DIFW) | October 8, 2021 |
| Maine Bureau of Parks and Lands | October 8, 2021 |
| Maine Department of Environmental Protection (Maine DEP) | October 8, 2021 |
| John Kirk III – *Ripogenus only* | October 12, 2021 |
| Christopher Howe – *Ripogenus only* | October 12, 2021 |
| Bechham Bayreuther | October 12, 2021 |
| Sarah Sindo – *Ripogenus only* | October 12, 2021 |
| Miles Puleio | October 12, 2021 |
| Brendan Alterio | October 12, 2021 |
| Douglas Binder – *Ripogenus only* | October 12, 2021 |

| | |
|---|---|
| E. Drew Fayle – *Ripogenus only* | October 12, 2021 |
| Chad Mclaughlin – *Ripogenus only* | October 12, 2021 |
| Gregory Friel – *Ripogenus only* | October 12, 2021 |
| Michael Hudson – *Ripogenus only* | October 12, 2021 |
| Robert Vadas | October 12, 2021 |
| Maine Council of Trout Unlimited (Maine TU) | October 12, 2021 |
| Maine Department of Marine Resources (Maine DMR) | October 12, 2021 |
| Penobscot Indian Nation | October 13, 2021 |

All comments received are part of the Commission's official record for the project. Information in the official file is available for review on the Commission's website at https://www.ferc.gov, using the "eLibrary" link. At this time, the Commission has suspended access to the Commission's Public Reference Room due to the proclamation declaring a National Emergency concerning COVID-19 issued by the President on March 13, 2020. For assistance, please contact FERC at FERCOnlineSupport@ferc.gov, (866) 208-3676 (toll free), or (202) 502-8659 (TTY).

## 2.3 ISSUES RAISED DURING SCOPING

During the scoping meetings and scoping comment period, we received comments on GLHA's PAD and the Commission staff's SD1. In addition, participants filed study requests. The majority of comments identified concerns about current project operations and potential project effects on water quality, diadromous fish passage, fish and wildlife resources and habitat, recreational opportunities and boating access, and cultural resources. Many of these comments fall within the scope of issues identified in SD1 and will be addressed as part of the environmental analysis of the proposed Projects. Therefore, for many of the comments, no modifications to the scoping document were necessary. However, several issues were raised in the comments that either were not identified, or not adequately described, in SD1. We have modified SD2 accordingly. ***Below, we summarize these comments and provide responses by subject area***.

The summary does not address every comment received during the scoping process. For example, SD2 does not address comments on GLHA's PAD or requests for information. Nor does SD2 address recommendations for protection, mitigation, and enhancement (PM&E) measures, as the need for these measures will be analyzed in the NEPA document or any license orders that are issued for the Projects. We will request terms, conditions, recommendations, and comments when we issue our Ready for Environmental Analysis notice. SD2 also does not address administrative comments or recommendations, such as requests for changes to the mailing list. Those items will be addressed separate from the NEPA document. Lastly, we do not address comments on

the need for environmental studies, as these comments will be considered during the study plan development process.

**General**

Comment: Due to the complex nature of the Projects and their effects, NMFS recommended that Commission staff analyze the effects of the Projects in an EIS, instead of an EA. In support of its recommendation, NMFS states: (1) comments on the PAD from many stakeholders make a compelling argument that the Projects' dams and their operation likely result in considerable negative ecological effects to the West Branch; (2) the new flow and impoundment management regimes implemented since the last relicensing may affect the endangered Gulf of Maine distinct population segment of Atlantic salmon and its designated critical habitat; and (3) relicensing is expected to generate significant public interest.

Response: Based on our initial review of the project and the definition of "significantly" in 40 C.F.R. §1508.27, we have not yet decided what type of NEPA document will be prepared in this case. As we indicated in SD1, our decision on whether to prepare an EA or EIS will be determined after the license application is filed and we fully understand the scope of effects and measures under consideration. Nonetheless, we have modified Section 6.0, *EA Preparation Schedule*, to say that we intend to prepare a draft and final NEPA document and provide an appropriate public comment period on our draft NEPA document. This scoping process will satisfy NEPA requirements irrespective of whether an EA or EIS is issued by the Commission.

Comment: NMFS, American Whitewater and the Appalachian Mountain Club, the Penobscot Indian Nation, and the Restorative Justice Institute requested that the Commission include, in its NEPA document, an alternatives analysis that includes decommissioning and removal of the Ripogenus and Penobscot Mills dams.

Response: As noted in Section 3.4.3, *Project Decommissioning*, the Commission has held that decommissioning is not a reasonable alternative to relicensing in most cases, and the Commission does not speculate about possible decommissioning measures at the time of relicensing, but rather waits until an applicant actually proposes to decommission a project, or a participant in a relicensing proceeding demonstrates that there are serious resource concerns that cannot be addressed with appropriate license measures and that make decommissioning a reasonable alternative. In this case, GLHA does not propose decommissioning, nor does the record, to date, demonstrate that there are serious resource concerns that cannot be mitigated if the projects are relicensed.

For example: (1) while the projects may affect the federally listed Gulf of Maine distinct population segment of Atlantic salmon in the mainstream Penobscot River due to operational and flow releases at the Projects,[6] the West Branch does not contain critical habitat for Atlantic salmon, nor is the habitat in the West Branch essential to achieve the species' recovery goals in the Penobscot River watershed;[7] (2) restoration of American shad, river herring, and sea lamprey is not currently a goal for the West Branch, and upstream and downstream fish passage is not currently necessary for Atlantic salmon or other anadromous species;[8] (3) there are no Tribal lands affected by the Projects; (4) the West Branch is not a protected river; (5) no water quality, recreation, or historic property issues raised during scoping would necessitate decommissioning and/or dam removal; and (6) there are a number of businesses, seasonal camps, and residences surrounding the project impoundments that rely on the projects' impoundments.

Therefore, we do not intend to include project decommissioning with dam removal as an alternative to relicensing the Projects in the NEPA document.

Comment: Michael Hudson recommended that the environmental review process include an alternative with lake level restrictions for the Ripogenus Impoundment.

Response: As described in section 4.1, *Resource Issues*, we intend to address lake level drawdowns and fluctuations on Ripogenus Impoundment, and any associated effects on environmental and recreational resources, as part of our environmental review of the Projects. Our environmental review will inform the Commission's decision as to any lake level restrictions to be included in any new license issued for the Ripogenus Project.

Comment: The Penobscot Indian Nation noted that SD1 refers to the West Branch of the Penobscot River downstream from Stone Dam as the "Back Channel," which it considers offensive, as it diminishes the importance of the river channel and creates confusion as to what section of the river is being referenced. The Penobscot Indian Nation asks that the term "Back Channel" not be used. Maine Council TU noted that GLHA uses terms like "bypassed reach" and "Back Channel," which it points out can minimize the effects of the Projects. Maine Council TU requests that different language that more accurately describes the affected reach be used.

[6] *See* NMFS's October 8, 2021 Comments at 2.

[7] *Id*. at 8 and 9.

[8] *See* Maine DMR's October 12, 2021 Comments at 6.

Response: The terminology in the scoping document has been revised accordingly.

Comment: Daniel McCaw of the Penobscot Indian Nation asked, during the September 9, 2021, scoping meeting, about how the 2018 *American Rivers* court case, which vacated Alabama Power Company's project license for the Coosa River Project No. 2146 and remanded the matter back to the Commission for further consideration, affects the Commission's relicensing process for the Projects; specifically related to baseline conditions. The Penobscot Indian Nation seeks to understand the *American Rivers* court case, the connections to the cumulative effects of the Projects, and the use of the historic, pre-dam conditions for analysis by the Commission.

Response: As stated by Commission staff during the September 9, 2021, scoping meeting, the D.C. Circuit Court of Appeals, in *American Rivers v. FERC* did not change the Commission's baseline.[9] Rather, the Court held that the Biological Opinion prepared by FWS for the Coosa River Project did not appropriately consider the degradation to the environment caused by the project's operation and its continuing impacts in establishing an environmental baseline under the Endangered Species Act.[10] While this court case does not change the Commission's definition of baseline conditions, Commission staff does consider, in cases where it is appropriate, past and on-going project effects in its environmental review of a project. Therefore, no changes to the scoping document are necessary.

Comment: NMFS recommended that the Commission work with the Penobscot Indian Nation to understand and fully consider their positions and interests regarding the potential continued operation of the Projects.

Response: We intend to work with all stakeholders, including the Penobscot Indian Nation throughout the relicensing process for the Projects. No changes to the scoping document are necessary.

**Federal Land**

Comment: The Penobscot Indian Nation disagreed with Commission staff's characterization that the Ripogenus Project and the Penobscot Mills Project do not occupy any federal lands. The Penobscot Indian Nation states that it has inhabited the Penobscot River, including the West and East Branches, from time immemorial and that

[9] *American Rivers v. FERC*, 895 F.3d 32 (D.C. Cir. 2018).

[10] *Id.* at 46.

these areas represent their aboriginal lands. The Penobscot Indian Nation also stated that it has not ceded its aboriginal title to the Penobscot River and its branches in any treaty, nor has Congress extinguished that aboriginal title. Thus, the Penobscot Indian Nation contends that the Projects, which are located on the West Branch, occupy federal lands in the form of the Penobscot Reservation.

Response: Beginning with the 1984 relicensing of the West Enfield Project on the Main Stem Penobscot River, the Commission has consistently concluded that the United States does not have a proprietary interest in the aboriginal lands (i.e., the river islands) of the Penobscot Nation, and so these lands are not a "reservation" within the meaning of the Federal Power Act.[11] The Penobscot Indian Nation's comments did not provide any information that would change that finding. Therefore, the scoping document has not been modified.

**Project Facilities**

Comment: GLHA provided several corrections and clarifications to the descriptions in SD1 for project facilities associated with the Millinocket, Dolby, and East Millinocket Developments.

Response: Section 3.1.1., *Project Facilities-Penobscot Mills Project*, has been revised accordingly.

**Geology and Soils**

Comment: American Whitewater and the Appalachian Mountain Club recommended that the NEPA document include an analysis of the effects of flow diversion and dewatering of the natural river channel downstream from Ripogenus Dam and Stone Dam on sediment transport.

Response: The NEPA document for the Ripogenus and Penobscot Mills Projects will include an analysis of the Projects' operational effects on sediment transport in the West Branch downstream from Ripogenus Dam and Stone Dam. Section 4.1.1, *Geologic and Soils Resources*, has been revised accordingly.

[11] *Bangor Hydro-Electric Co.*, 27 FERC ¶ 61,467, at 61,875 (1984); *see also Bangor Hydro-Electric Co.*, 83 FERC ¶ 61037, at 61083 (1998).

## Water Resources and Project Operation

Comment: Numerous stakeholders commented on low lake levels on the Ripogenus Impoundment, as well as the effects of drawdowns within the Ripogenus, Millinocket Lake Storage Dam, and North Twin Impoundments on littoral and riparian habitats in, and around, the impoundments. These stakeholders recommend that the NEPA document include an analysis of the effects of drawdowns on the Ripogenus, Millinocket Lake Storage Dam, and North Twin Impoundments on the impoundments' littoral zone, riparian areas, and associated aquatic and wildlife communities; angling opportunities on the Ripogenus Impoundment; recreation access to, and use of, Caribou Lake, Chesuncook Lake, and Ripogenus Lake; public safety; water supply to properties around the Ripogenus Impoundment; educational opportunities; and the aesthetics of the area.

Response: As indicated in sections 4.1.2, *Water and Aquatic Resources*, 4.1.3, *Wildlife and Botanical Resources*, and 4.1.5, *Recreation, Land Use, and Aesthetics*, drawdowns and low lake levels within the Ripogenus Impoundment on environmental and recreational resources will be analyzed in the NEPA document. Sections 4.1.2, 4.1.3, and 4.1.5 have been revised to clarify the specific resources to be analyzed.

Comment: NMFS, Maine DIFW, Edward Spear, John Kirk, III, Sarah Sindo, and Miles Puleio commented on flow management in the West Branch and the Projects' existing Water Use Plan and its effects on flows in the West Branch and mainstem of the Penobscot River. Stephen Heinz commented on the effects of climate change on operating the Projects and the hydrology of the West Branch.

Response: As indicated in sections 4.1.2, *Water and Aquatic Resources*, the NEPA document will include an analysis of continuing to operate the Projects on water quantity and flow in the West Branch, including effects on impoundment levels and downstream flooding. Section 4.1.2 has been revised to indicate that we intend to evaluate the effects of the existing Water Use Plan and alternatives to that plan, as well as the scope of downstream affects.

With regard to climate change, we are not aware of any available climate change model or assessment that would support, with any degree of accuracy and reliability, prediction of water availability at the individual project level. Therefore, information from general climate research and modeling will not be considered as part of the NEPA review process and development of the NEPA document. However, historical data for project operations and flows can be used to evaluate trends in, and changes to, the hydrology of the West Branch over time. This information will be used to establish the

baseline for the environmental analysis of aquatic resources, as well as evaluating potential project effects on those resources.

Comment: FWS, NMFS, and American Whitewater and the Appalachian Mountain Club, commented on the description in the scoping document of how the Projects operate. Specifically, the commentors state that the projects do not operate in a storage-and-release mode, but rather are peaking facilities (including the developments characterized as run-of-river, which receive peaking flows from upstream developments).

Response: The description in the scoping document of how the Projects are operated has been revised accordingly.

Comment: American Whitewater and the Appalachian Mountain Club commented on the effects of flow diversion and dewatering of the natural river channel downstream from Ripogenus Dam and Stone Dam on aquatic habitat, river connectivity, sediment transport, water quality, recreational opportunities, and aesthetics.

Response: The NEPA document will evaluate the effects of flow diversion and dewatering of the natural river channel downstream from Ripogenus Dam and Stone Dam on the environmental and recreational resources identified by American Whitewater and the Appalachian Mountain Club. Section 4.1, *Resources Issues*, has been revised to clarify the specific resources to be analyzed.

Comment: American Whitewater and the Appalachian Mountain Club recommended that the NEPA include an analysis of the effects of the pumping operation at Millinocket Lake Storage Dam on flow releases into Millinocket Stream. The specific interest is in natural flow variability that would be beneficial to aquatic habitat and recreation, and that does not degrade water quality.

Response: The NEPA document will include an analysis of the pumping operation at Millinocket Lake Storage Dam and its effects on flow releases to Millinocket Stream. Section 4.1.2, *Water and Aquatic Resources*, has been revised accordingly.

**Water Quality**

Comment: American Whitewater and the Appalachian Mountain Club recommended that the NEPA document include an analysis of the effects of flow diversion and dewatering of the natural river channel downstream from Ripogenus Dam and Stone Dam on water quality in the West Branch. NMFS recommended that the NEPA document include an analysis of the effects of project operation on water temperature in the West Branch and mainstem Penobscot River.

Response: As indicated in section 4.1.2, *Water and Aquatic Resources*, the effects of project operation on dissolved oxygen and water temperature in the project impoundments and affected reaches of the West Branch will be evaluated in the NEPA document. This analysis will extend to the mainstem Penobscot River due to the lack of any operational effects of the downstream Medway Project No. 2666 and Mattaceunk Project No. 2520 on water quality in the mainstem Penobscot River. Section 4.1.2 has been revised accordingly.

Comment: Maine Council TU, Paul Johnson, and Robert Vadas recommended that the NEPA document include an analysis of the effects of flow release elevation at Ripogenus Dam on water temperature in the Upper Gorge and the West Branch downstream from Ripogenus Dam, including downstream from McKay Station.

Response: As indicated in section 4.1.2, *Water and Aquatic Resources*, the effects of project operation on water quality in the project impoundments and affected reaches of the West Branch will be evaluated in the NEPA document. Section 4.1.2 has been revised to clarify that the analysis in the NEPA document will include an analysis of the flow release elevation at Ripogenus Dam and its effect on water temperature in the Upper Gorge and the West Branch downstream from McKay Station.

**Fish and Aquatic Resources**

Comment: Stephen Condren commented on the effects of low flows and exposed river bottom on aquatic insects in the West Branch. Edward Spear recommended that the NEPA document include an analysis of the effects of operating the Projects (i.e., peaking and fluctuating flows) on aquatic macroinvertebrates in the West Branch. American Whitewater and the Appalachian Mountain Club recommended that the NEPA document include an analysis of the effects of flow diversion and dewatering of the natural river channel downstream from Ripogenus Dam and Stone Dam on aquatic habitat and river connectivity. Maine DIFW recommended that the NEPA document include an analysis of the effects of summer drawdowns greater than 10 feet in the Ripogenus Impoundment on macroinvertebrate abundance and diversity. Finally, Sarah Sindo commented on the effects of low-flow excursions downstream from McKay Station on crayfish and other macroinvertebrates in the West Branch.

Response: The NEPA document will include an analysis of flows and flow fluctuations in the West Branch downstream from the project dams and powerhouses on aquatic organisms, including fish populations and movement and macroinvertebrates (e.g., aquatic insects and crayfish). Section 4.1.2, *Water and Aquatic Resources*, has been revised accordingly.

Comment: Edward Spear recommended that the NEPA document include an analysis of the effects of operating the Projects on smelt abundance and downstream drift in the project impoundments and West Branch, as well as lake whitefish populations in the Ripogenus impoundment. Maine DIFW recommended that the NEPA document include an analysis of the effects of operating the Projects on smelt drift in the West Branch. Robert Vadas commented on the effects of operating the Projects on smelt drift in the West Branch.

Response: The NEPA document will include an analysis of smelt populations and drift in the project impoundments and the West Branch, as well as the lake whitefish population in the Ripogenus Impoundment. Section 4.1.2, *Water and Aquatic Resources*, has been revised accordingly.

Comment: FWS recommended that the NEPA document include an analysis of the effects of continuing to operate the Projects on water and aquatic resources, including fish migration, as well as wildlife and botanical resources in, and along, the project impoundments and the West Branch. The analysis would cover each individual development, as well as the Projects' potential indirect effects on the mainstem Penobscot River.

Response: As indicated in section 4.1.2, *Water and Aquatic Resources*, and section 4.1.3, *Wildlife and Botanical Resources*, the effects of continuing to operate the Projects on: (1) water and aquatic resources, including fish migration and movement; (2) wetlands; and (3) littoral and riparian habitat in, and along, the project impoundments and the West Branch will be included in the NEPA document. Section 4.1.3 has been revised to indicate that we intend to analyze the effects of operating the Projects on wildlife in the project area. However, as indicated in the scoping document, the NEPA review will be done in accordance with CEQ's new NEPA regulations, which, at this time, do not require an analysis of a project's indirect effects on resources affected by other development in the basin.

Comment: FWS recommended that the analysis of fish entrainment not be limited to fish populations, but also should include an analysis of the effects on food web interactions and overall ecosystem productivity.

Response: As indicated in section 4.1.2, *Water and Aquatic Resources*, the effects of continuing to operate the Projects on fish impingement and entrainment will be included in the NEPA document. However, the entrainment analysis will not include the effects on the food web and overall ecosystem productivity, because food web effects related to project operations would be difficult to distinguish from other factors. Moreover, we would be concerned with food web interaction if there were an identified

population effect, which is not established in this case. Therefore, no changes to the scoping document have been made at this time.

Comment: Maine DIFW recommended that any analysis of fish passage for sea-run species in the NEPA include an analysis of the effects of providing passage for migratory species on the establishment of invasive species in the project impoundments and the West Branch.

Response: Because providing passage at dams has the potential to allow unwanted, invasive species to access upstream habitats, which could disrupt native fish and aquatic organisms, the analysis of fish passage in the NEPA document will include consideration of introducing invasive species to habitats in the West Branch watershed. Section 4.1.2, *Water and Aquatic Resources*, has been revised accordingly.

Comment: Maine DMR recommended that the NEPA document include an analysis of the effects of operating the Projects on diadromous fish movement, passage, and habitat in the project area and the West Branch.

Response: As indicated in section 4.1.2, *Water and Aquatic Resources*, the effects of continuing to operate the Projects on diadromous fish movement and passage will be included in the NEPA document. Section 4.1.2 has been revised to clarify that the NEPA document will also consider the effects on migratory fish habitat, where appropriate.

**Terrestrial Resources**

Comment: Tom Janelle commented that without stable water levels, the large and consistent drawdowns on the water quality of Caribou Lake and changes to the shoreline will have lasting and profound effects on the wildlife in the area (e.g., establishment of plants and trees in the lake bed due to low water levels). Kathleen Houston commented on the fluctuating lake levels in Ripogenus Impoundment and the potential for ongoing and future harm to wildlife and the lake ecosystem. Ms. Houston observed that hundreds of feet of shoreline are covered in plants and trees, and that this level of succession is not the result of a 1- or 2-year drought.

Response: As indicated in section 4.1.3, *Wildlife and Botanical Species*, the effects of continuing to operate the Projects on wildlife and plant species, as well as riparian habitat will be included in the NEPA document. Section 4.1.3 has been revised to clarify that the analysis will include potential effects of the drawdowns and low lake levels on riparian areas around the Ripogenus Impoundment and wildlife dependent on those habitats.

Comment: Owen Genest commented on the ecological and biological effects of the water level fluctuations in Chesuncook Lake and Caribou Lake; specifically making it more difficult for wildlife to access water and forage on aquatic vegetation, as well as increasing the vulnerability to predators. Peter Forti commented that the steady decline of water levels over the years has not only affected recreational activities but has also affected wildlife (e.g., eagles, osprey, herons, loons and other birds that rely on the lakes for their food supply, as well as animals that rely on the lakes for drinking water). Douglas Binder commented on the effects of water level fluctuation within the lakes and associated effects on wildlife populations.

Response: As indicated in section 4.1.3, *Wildlife and Botanical Species*, the effects of continuing to operate the Projects on wildlife and plant species will be included in the NEPA document. No changes to the scoping document are necessary.

Comment: Maine DIFW identified several state endangered, threatened, and species of special concern that are likely to occur in the vicinity of the Projects, including the: (1) state endangered little brown bat, northern long-eared bat, and resident and migratory golden eagle; (2) state threatened eastern small-footed bat; (3) state special concern big brown bat, red bat, hoary bat, silver-haired bat, tri-colored bat, wood turtle, bigmouth pondsnail, and pygmy snaketail dragonfly; and (4) rare mussel species. In addition, Maine DIFW reports that the Projects' impoundments contain inland waterfowl and wading bird habitats, which provide important breeding, feeding, migration, staging, and wintering habitat for waterfowl and wading bird species, and are considered Significant Wildlife Habitat under Maine's Natural Resources Protection Act.

Response: As indicated in section 4.1.3, *Wildlife and Botanical Species*, the effects of continuing to operate the Projects on state-protected wildlife and plant species will be included in the NEPA document. Section 4.1.3 has been revised to clarify that the analysis will consider Species of Special Concern and Significant Wildlife Habitat that are listed under Maine's Natural Resources Protection Act.

**Threatened and Endangered Species**

Comment: NMFS recommended that the NEPA document include an analysis of the effects of continuing to operate the Projects on the movement, passage, and restoration/recovery of the Gulf of Maine Distinct Population Segment of the Atlantic salmon in the Penobscot River Basin.

Response: As indicated in section 4.1.4, *Threatened and Endangered Species*, the effects of continuing to operate the Projects on the Gulf of Maine Distinct Population Segment of the Atlantic salmon and its critical habitat will be included in the NEPA

document. Section 4.1.4 has been revised to clarify that the analysis will consider the movement, passage, and restoration/recovery of the species.

Comment: FWS commented on the little brown bat and the tri-colored bat within the Projects' boundaries. Both species are currently undergoing consideration for listing by FWS under the Endangered Species Act.

Response: The NEPA document will discuss the effects of the Projects on the little brown bat and the tri-colored bat. Section 4.1.3, *Wildlife and Botanical Species*, has been revised to include these two species as well as other state threatened and endangered species potentially occurring in the Project areas. If these two bat species become federally listed, they will be addressed in section 4.1.4, *Threatened and Endangered Species.*

**Recreation, Land Use, and Aesthetics**

Comment: Benjamin Koehler commented on a 10-foot waterfall in the West Branch between Quakish Lake and Dolby Pond and its significance as an aesthetic and recreational resource.

Response: The NEPA document will address the aesthetic qualities of the West Branch in the vicinity of the Projects. Section 4.1.5, *Recreation, Land Use, and Aesthetic Resources,* has been revised to include the effects of operating the Projects, including maintenance activities, on aesthetic resources.

Comment: Ryan Gerry, Alexandra Horne, Christopher Howe, Alec Jansujwicz, Benjamin Koehler, Jake Risch, and Michael Smith commented on the potential whitewater recreation opportunities, including flows, of the West Branch (i.e., the Upper Gorge and the West Branch downstream from Stone Dam) and Millinocket Stream.

Response: The NEPA document will include an analysis of whitewater recreation opportunities on the West Branch. Section 4.1.5, *Recreation, Land Use, and Aesthetics*, has been revised to include the effects of operating the Projects on the whitewater recreation potential of the Upper Gorge, the West Branch downstream from Stone Dam, and Millinocket Stream.

Comment: The Maine Bureau of Parks and Lands commented on the effects of low lake levels on boat access to Chesuncook Lake, the North Twin Impoundment (Ambajejus and South Twin Lakes), and Millinocket Lake.

Response: Changes in how the Projects are operated (i.e., lake level drawdowns) have the potential to affect recreation infrastructure, such as boat launch accessibility and navigation within individual project impoundments, which may affect recreation in the area. As indicated in section 4.1.5, *Recreation, Land Use, and Aesthetics*, the NEPA document will include an analysis of continuing to operate and maintain the Projects on project recreation facilities and their use.

Comment: Brendan Alterio commented on the effects of low lake levels on views of Mt. Katahdin.

Response: As described in section 4.1, *Resource Issues*, the NEPA document will include an analysis of lake level drawdowns and fluctuations on Ripogenus Impoundment, and any associated effects on environmental and recreational resources. Section 4.1.5, *Recreation, Land Use, and Aesthetic Resources,* has been revised to include the effects of project operation and maintenance activities on the aesthetic quality of the area.

Comment: Edward Spear recommended that the NEPA document include an analysis of the effects of continued operation of the Projects on angling opportunities and success for landlocked Atlantic salmon in the West Branch downstream from Ripogenus Dam. Robert Vadas commented on the effects of Project flows on angling success in the West Branch, including the effects of flow releases into the Upper Gorge and whitewater flow releases from McKay Station on the brook trout fishery.

Response: The NEPA document will include an analysis of continuing to operate the Projects on angling opportunities and success, especially for landlocked Atlantic salmon and brook trout. Section 4.1.5, *Recreation, Land Use, and Aesthetics*, has been revised accordingly.

**Cultural Resources**

Comment: The Maine Historic Preservation Commission commented that it was unclear in SD1 if the entire project boundary has been surveyed for architectural resources, and archaeological sites in the APE. The Maine Historic Preservation Commission recommended identification of all resources in the APEs for the Projects.

Response: Section 4.1.6, *Cultural Resources,* has been revised accordingly.

Comment: Benjamin Koehler commented that the Projects have significant effects on cultural resources.

Response: The NEPA document will include an analysis of the effects of relicensing the Projects on cultural resources. In addition, GLHA proposes to develop a Historic Properties Management Plan for each project to protect cultural resources.

**Socioeconomics**

Comment: The Penobscot Indian Nation expressed concerns with Environmental Justice regarding the continued operation of the Projects, as the Projects may disproportionately affect minority and low-income people, including Native Americans, living in the region. The Penobscot Indian Nation asked that Commission staff provide the stakeholders guidance as to Environmental Justice concerns at the Projects, as well as any recent changes in the Commission's NEPA analysis that may or may not include sections on Environmental Justice and how that analysis may relate to the Projects.

Response: We intend to use EPA's EJSCREEN tool to analyze whether there are environmental justice communities in the vicinity of the Projects. However, this analysis has not yet been completed. The scoping document has been modified to reflect the need to analyze whether such communities exist in the vicinity of the Projects, and, if so, if they are subject to disproportionately high adverse human health or environmental effects as a result of the Projects. Section 4.1, *Resource Issues*, has been revised to include a category for Socio-Economic issues, including Environmental Justice. In addition, Section 7.0, *Proposed NEPA Document Outline*, has been added to the scoping document, which includes a section for analyzing Socio-Economic and Environmental Justice issues.

Comment: The Allagash Gateway Campground recommended that the Commission's NEPA analysis include the effects of the Ripogenus Impoundment's unregulated low water levels on the economy of the surrounding area. Emelia Ferland requests that the Commission assess the effects of low water levels on Caribou Lake and Chesuncook Lake (part of the Ripogenus Impoundment) on property values. The Caribou and Chesuncook Lake Camp Owners Association and the Chesuncook Dam Camp Owners Association recommended that the NEPA document include an analysis of the effects of water level fluctuations within the Ripogenus Impoundment of property values of the residences around the impoundment.

Response: Changes in how the Projects are operated (i.e., lake level drawdowns) have the potential to affect recreation infrastructure, such as boat launch accessibility and navigation within individual project impoundments, which may affect tourism and recreation in the area. Section 4.1.7, *Socioeconomic Resources*, has been added to the scoping document, and will include a broad analysis of the potential effects of operating the Projects on local and regional economies. However, the Projects' operational effects

on the values of specific, individual properties, will not be addressed, as such estimates could be construed as "damages," which the Commission cannot adjudicate under the FPA.

Comment: The Penobscot Indian Nation commented on the need to consider existing socioeconomic conditions in the area around the Projects as part of the environmental review process.

Response: The NEPA document will include a discussion of the past and present socioeconomic conditions in the vicinity of the Projects. Section 4.1, *Resource issues*, has been revised to include a section for socio-economic issues. Also, section 7.0, *Proposed NEPA Document Outline*, has also been added to the scoping document, which includes a section for Socioeconomic Resources.

**Developmental Resources**

Comment: Edward Spear stated that the Projects were initially licensed to provide power to the paper mills in the area, and that since the closure of the paper mills, GLHA has used the West Branch system [*including the Ripogenus and Penobscot Mills Projects*] as a spinning reserve power source. Mr. Spear contends that this operation affects the fisheries in the system.

Response: The NEPA document will include an evaluation of the proposed action, as well as alternatives to the proposed action, including current operations and any operational alternatives developed based on the outcome of any studies conducted to support relicensing the projects. No changes to the scoping document are necessary.

## 3.0 PROPOSED ACTIONS AND ALTERNATIVES

In accordance with NEPA, the environmental analysis will consider the following alternatives, at a minimum: (1) the no-action alternative; (2) the applicant's proposed actions; and (3) alternatives to the proposed actions.

### 3.1 NO-ACTION ALTERNATIVE

Under the no-action alternative, the Ripogenus Project and Penobscot Mills Project would continue to operate as required by their current project licenses (i.e., there would be no change to the existing environment). No new environmental protection, mitigation, or enhancement measures would be implemented. We use this alternative to establish baseline environmental conditions for comparison with other alternatives.

### 3.1.1 Project Facilities

*RIPOGENUS PROJECT*

The Ripogenus Project is located about 21 river miles (RM) upstream of the Penobscot Mills Project on the West Branch of the Penobscot River (West Branch), which flows into Ambajejus Lake (part of the Penobscot Mills Project's North Twin Development). The project generally consists of a dam, reservoir, intake structure, a tunnel and penstocks, powerhouse with generation equipment, and a transmission line (figure 2).[12]

Ripogenus, Caribou, and Chesuncook Lakes and Black, Brandy, and Moose Ponds constitute the Ripogenus impoundment created by Ripogenus Dam. The impoundment is about 20.8 miles long and has a surface area of approximately 29,270 acres at the normal full pond elevation of 941.59 feet United States Geological Survey (USGS) datum.[13] The impoundment's mean depth is 35.8 feet, and usable storage is about 688,705 acre-feet, with a maximum drawdown of 44 feet (to elevation 897.59 feet).[14] Ripogenus Dam, a 795-foot-long concrete and earth-filled structure, is located at the outlet of Ripogenus Lake. The dam, which crosses the West Branch in a north-south direction, includes two concrete ogee[15] spillway sections totaling about 480 feet in length, a 37-foot-long intake section, a 178-foot-long gated sluice section, and a 100-foot-long earth section.

Water flows from Ripogenus impoundment through a concrete intake structure, which is protected by trash racks with 2-5/8 inch clear spacing. The intake structure connects to a 16-foot-diameter concrete-lined tunnel that is approximately 3,850 feet long and connects to three penstocks that lead to the powerhouse (McKay Station). Flows diverted to the tunnel, penstocks, and powerhouse bypass a 0.75-mile-long river reach (Upper Gorge) of the West Branch.

[12] This SD2 provides a summary of the Ripogenus Project and the Penobscot Mills Project facilities. The Ripogenus and Penobscot Mills Projects are described in greater detail in section 4.3, *Existing Project Facilities*, of the PAD.

[13] Unless otherwise noted, all elevations cited in this SD1 are in USGS datum.

[14] The Ripogenus Project also includes Umbazooksus Lake, which is a 1,600-acre former storage impoundment that is located within the project boundary. In 1998, the storage and release operations were discontinued so the current flow regime is run-of-river. Umbazooksus Lake, therefore, provides no storage capacity to the Ripogenus Project.

[15] An ogee-shaped spillway contains a controlled weir and is S-shaped in profile.

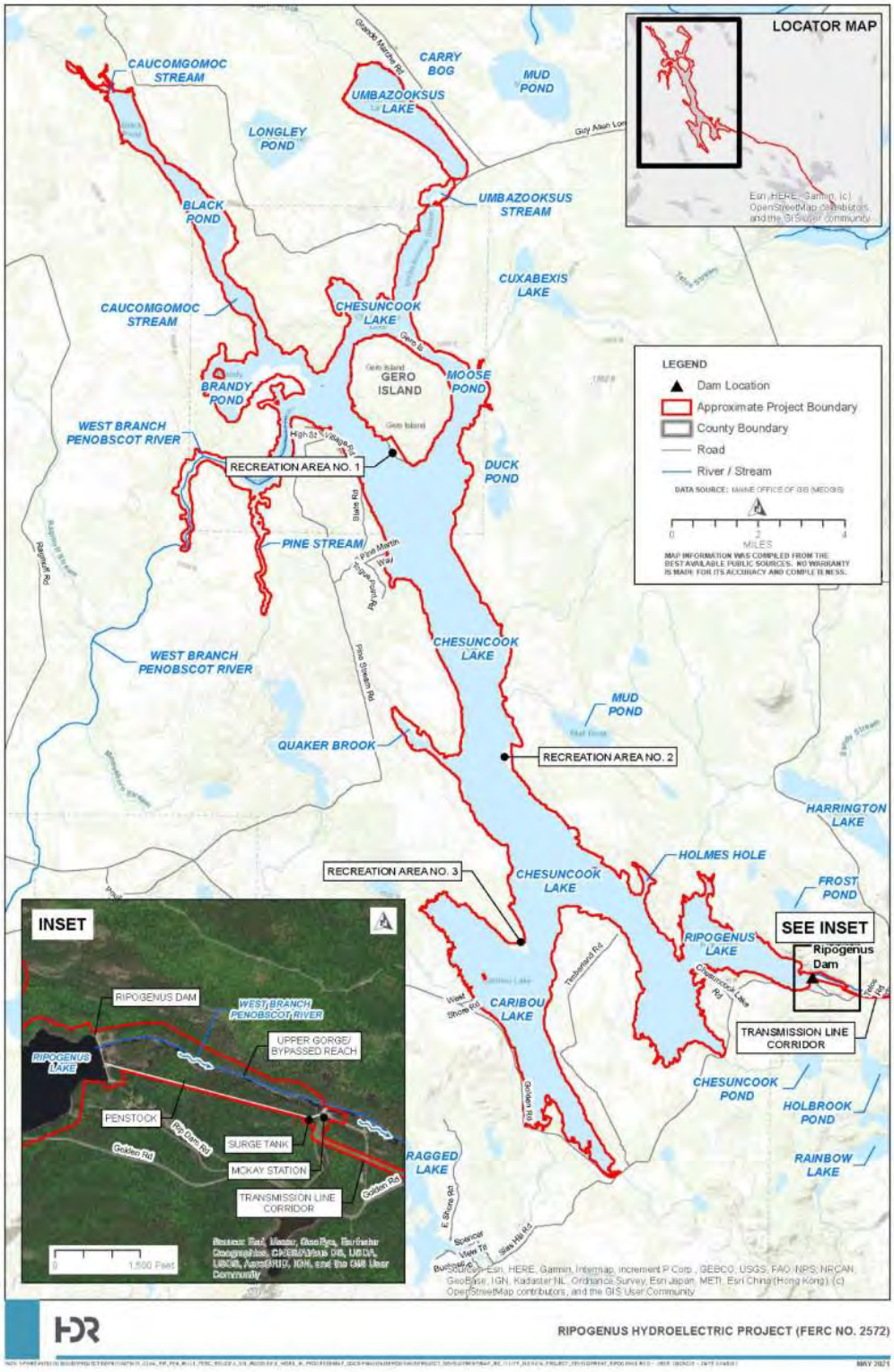



Figure 2. Ripogenus Hydroelectric Project facilities (source: PAD).

The 130-foot-long by 45-foot-wide powerhouse contains three vertical Francis-type turbines, each connected to a generator. The rated capacity of the three turbines is 38.6 MW, and the rated capacity of the three generators is 37.5 MW. Flow from the powerhouse is conveyed back to the West Branch via a 50-foot-long excavated bedrock tailrace.

The power generated at the Ripogenus Project is transmitted to the electric grid via three transformers and transmission lines that start at the substation at McKay Station and extend about 29.4 miles to GLHA's Millinocket Substation #4 (part of the Penobscot Mills Project). An additional 0.75-mile-long transmission line extends from the McKay Substation to Ripogenus Dam to supply backup power to the gate operators and to Ripogenus Village.

The Ripogenus Project also contains one utility-scale battery energy storage site that is part of a Battery Energy Storage System at the Projects (*see* Battery Energy Storage System description for the Penobscot Mills Project).

*PENOBSCOT MILLS PROJECT*

The Penobscot Mills Project consists of four hydropower developments (North Twin, Millinocket, Dolby, and East Millinocket; located between RM 15 and RM 2 on the West Branch of the Penobscot River) and one storage development (Millinocket Lake Storage Development; located on Millinocket Stream) (figure 3).[16] The primary features of the Penobscot Mills Project include five dams, five impoundments, and four powerhouses. The total installed capacity of the project is 67.9 MW.

The North Twin Impoundment is at the upstream end of the Penobscot Mills Project and receives flow from the Ripogenus Project (figure 3). Releases from the North Twin Development pass through three other developments and associated generation facilities of the Penobscot Mills Project, including the Millinocket, Dolby, and East Millinocket Developments. The Millinocket Lake Storage Development includes a pumping station through which water can be pumped to Ambajejus Lake (within the North Twin impoundment). Otherwise, water is discharged to Millinocket Stream, which enters the West Branch at Shad Pond (downstream from the Millinocket Development; *see* figure 6 below) and passes through the Dolby and East Millinocket Developments.

[16] *See* n. 12 *supra*.

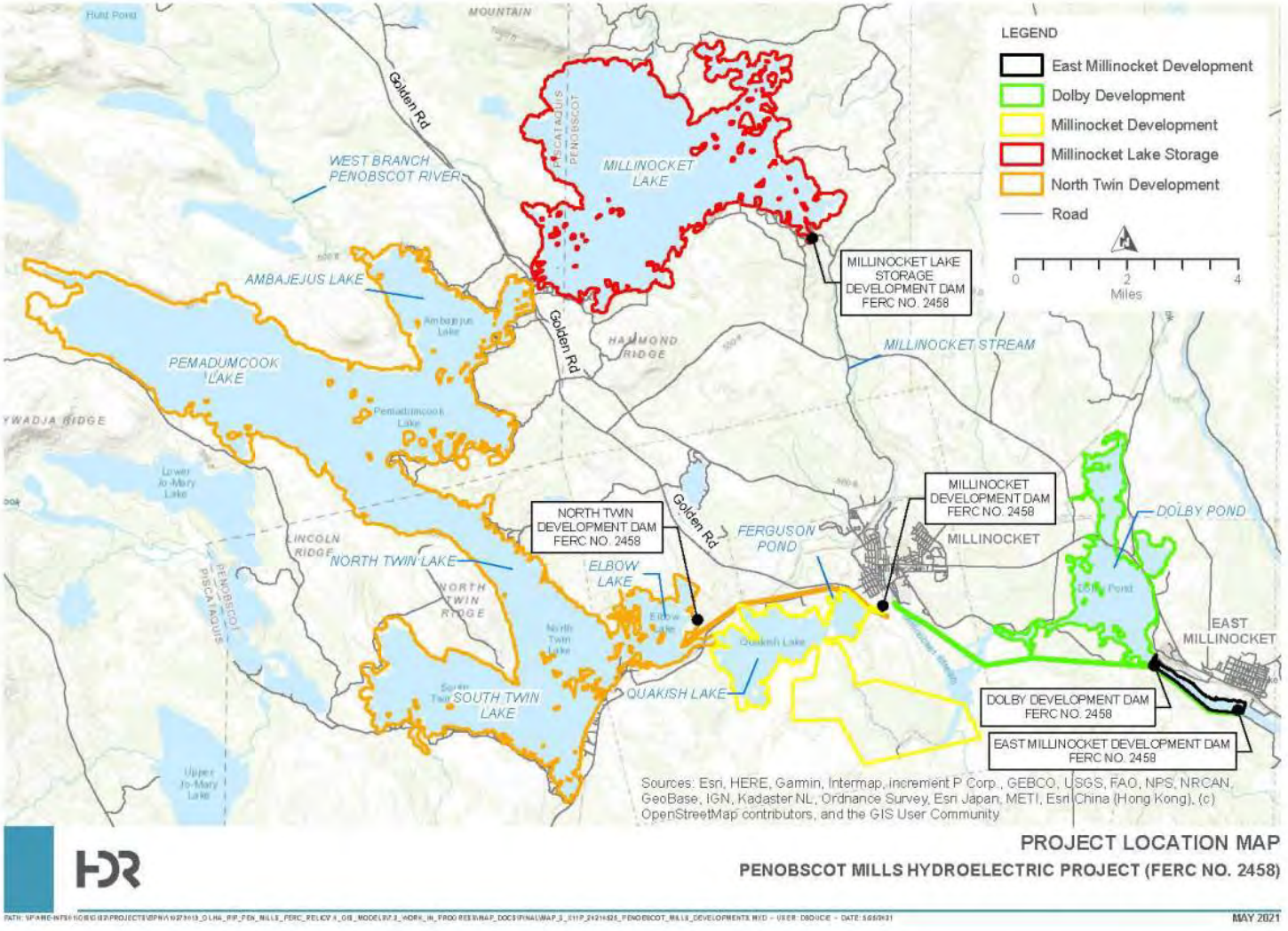



Figure 3. Penobscot Mills Hydroelectric Project Location Map (source: PAD).

**Millinocket Lake Storage Development (figure 4)** – Millinocket Lake has a normal full pond elevation of 480.0 feet, with a surface area of 8,640 acres. The lake has a mean depth of 23.6 feet. Usable storage of the lake is 45,370 acre-feet, with a 6.2-foot drawdown. Millinocket Lake is impounded by a 635-foot-long, concrete and earth-filled dam located on Millinocket Stream, at the outlet of Millinocket Lake. Millinocket Lake Storage Dam includes a 19-foot-long spillway section and an adjacent 58-foot-long gated section that contains four lift gates and one log sluice gate. The dam is located approximately 7.8 miles upstream of the Millinocket Development tailrace. The development's pumping station, which contains two pumps, is located on the west side of Millinocket Lake, about 6.2 miles from Millinocket Lake Storage Dam. Water is conveyed from the pumping station through two 544-foot-long, 4-foot, 6-inch-diameter steel pipes, which is then discharged to Ambajejus Lake through an outlet structure.

**North Twin Development (figure 5)** – The North Twin impoundment includes Elbow, South Twin, North Twin, Pemadumcook, and Ambajejus Lakes. The impoundment is about 11.8 miles long and has a surface area of approximately 17,790 acres at the normal full pond elevation of 491.92 feet. The impoundment's mean depth is 27.7 feet, and its usable storage is about 344,355 acre-feet with a drawdown of 22 feet. The North Twin impoundment is formed by North Twin Dam, which is a 1,051-foot-long concrete and earth-filled structure located at the outlet of Elbow Lake. The dam, which crosses the West Branch from southeast-northwest, includes a 500-foot-long, earthen dike; a 114-foot-wide intake structure and powerhouse; a 34-foot-wide fishway[17] section with two gated log sluices; a 117-foot-long Tainter gate section; and a 286-foot-long earthen embankment. In addition to the dam, there are six dikes, totaling 2,530 feet in length, retaining water.

Water flows from the North Twin impoundment through an intake structure to the powerhouse. The intake contains nine water passages, each 8 feet wide by 13 feet high and equipped with a steel gate to control the flow of water to the turbines. The intake is protected by trash racks with 2-5/8-inch clear bar spacing. The trash racks are cleaned with a trash rake. The 50-foot by 114-foot powerhouse, which is integral with, and located immediately downstream from the intake, contains two vertical fix-blade turbines and one vertical Kaplan turbine, each connected to a generator. The rated capacity of the three turbines is 7.0125 MW and the rated capacity of the three generators is 9.84 MW. Water exits the powerhouse through six tailrace bays and flows through a 104-foot-wide tailrace back to the West Branch.

[17] Flow to the 98-foot-long pool and weir fishway is controlled by three gates located at different depths upstream of the fishway. The upstream fishway provides passage for resident fish species (e.g., landlocked salmon).

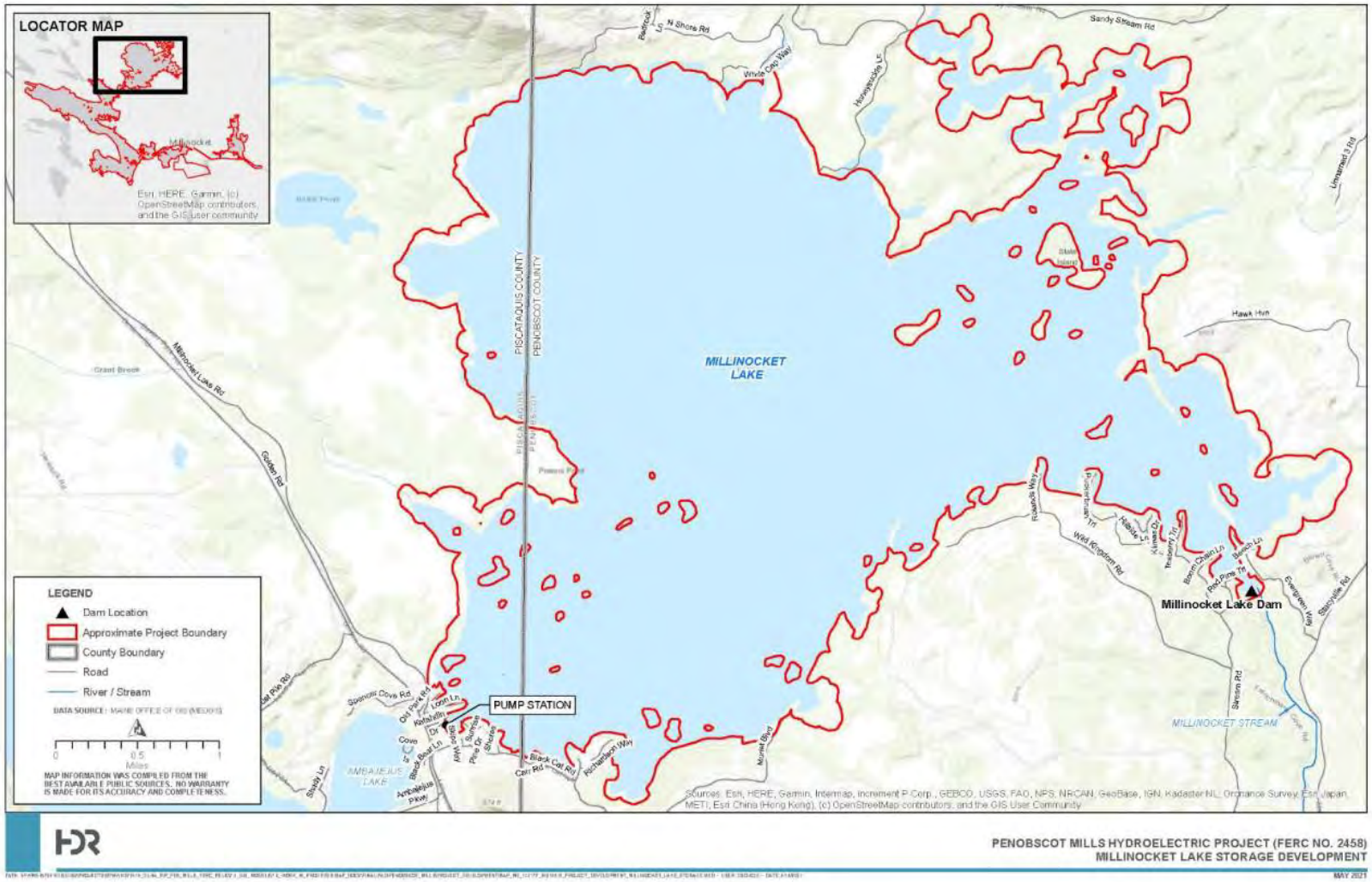



Figure 4. Millinocket Lake Storage Development facilities (source: PAD).

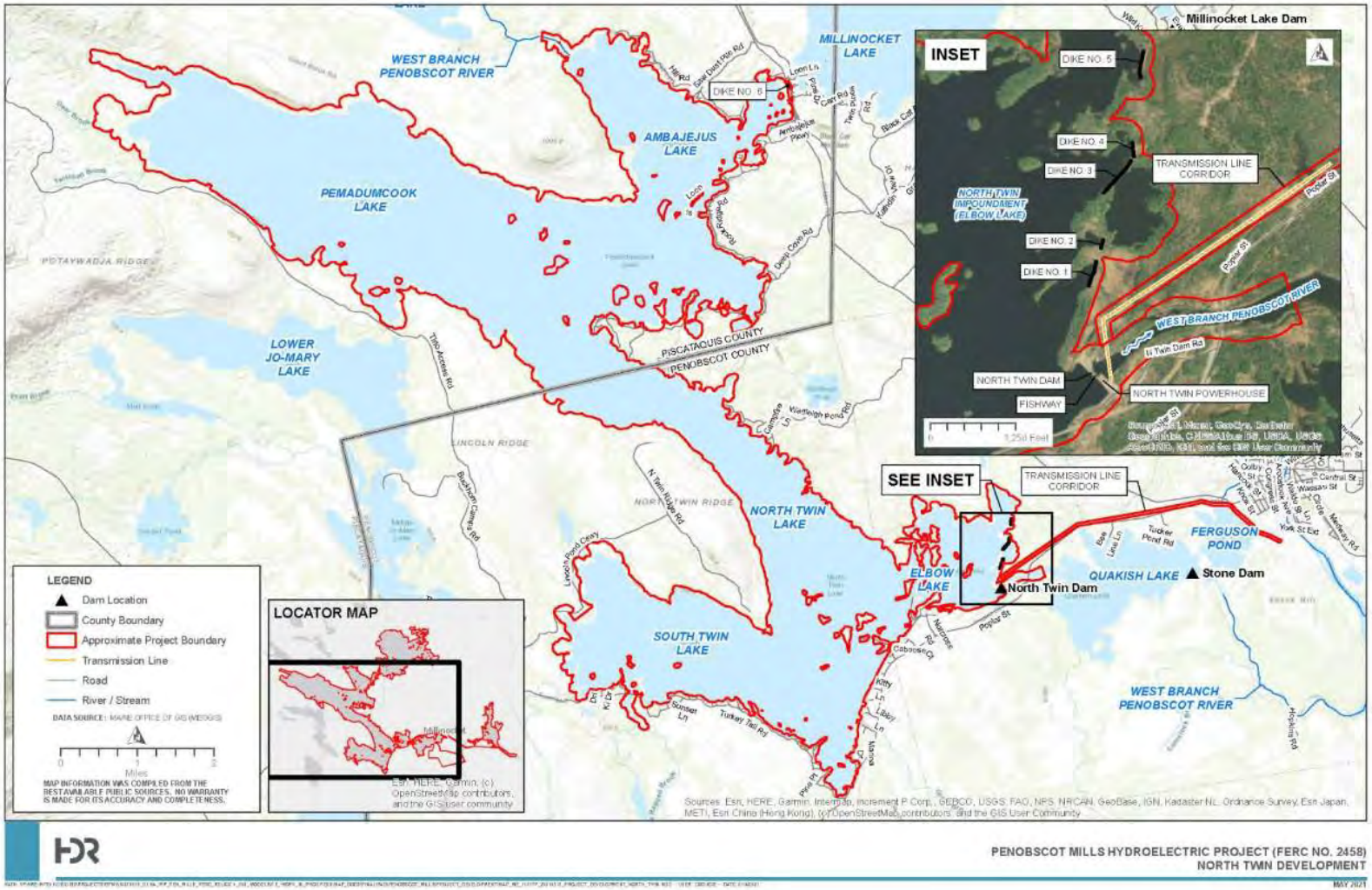



Figure 5. North Twin Development facilities (source: PAD).

The power generated by the North Twin Development is transmitted to the grid via an adjacent substation that contains six transformers and a 4.2-mile-long transmission line that extends to GLHA's Substation #4 located at the former Millinocket Mill.

**Millinocket Development (figure 6)** – The impoundment for the Millinocket Development consists of Quakish Lake and Ferguson Pond. The 8,600-foot-long Quakish Lake has a surface area of 1,344 acres at a normal full pond elevation of 458.7 feet. Quakish Lake and Ferguson Pond provide negligible storage. Stone Dam, a 1,262-foot-long, concrete structure, is located at the outlet of Quakish Lake. The dam directs water into the western canal, and consists of: (1) a 300-foot-long overflow spillway section with no flashboards; (2) a 358-foot-long spillway section with 30-inch-high flashboards; (3) a 52-foot-wide waste gate; (4) a 428-feet, 5-inch-long spillway with a 2-foot, 9-inch-high rubber, inflatable dam; and (5) a 124-foot-long gatehouse. In addition to Stone Dam, there are three dikes, with a total length of 1,854 feet, located along the north shore of Quakish Lake that retain water.

The gatehouse is integral with Stone Dam and is used to regulate flow into the 150-foot-wide by 1,400-foot-long western canal. The western canal conveys water from Quakish Lake to Ferguson Pond. Five earthen dikes, with a total length of 3,915 feet, are located along the perimeter of Ferguson Pond and are used to confine the area impounded by Ferguson Pond. From Ferguson Pond, water enters the 150-foot-wide by 1,300-foot-long eastern canal which conveys water from Ferguson Pond to an intake structure.

The intake structure contains seven gates. Six gates control flow into six 1,007-foot-long, 10-foot-diameter penstocks that lead to turbine-generator units in the 'Grinder Room.' The remaining gate controls flow into a 1024-foot-long, 11-foot-diameter penstock that leads to turbine-generator units in the 'Generator Room.' The 10-foot-diameter penstocks are protected by trash racks with 2-7/8-inch clear bar spacing, and the 11-foot-diameter penstock is protected by trash racks with 2-1/2-inch clear bar spacing. The 174.5-foot-wide by 210-foot-long Grinder Room contains five horizontal Francis turbine-generator units (Units 1, 3, 4, 5, and 6)[18] and the 52-foot-wide by 122-foot-long Generator Room contains two horizontal Francis turbine-generator units (Units 7 and 8). The rated capacity of the seven turbines is 37.3748 MW, and the rated capacity of the seven generators is 38.64 MW. Water exits the turbines through seven, 25-foot-wide tailrace bays that discharge directly to ***Millinocket Stream and then flows downstream into Shad Pond and*** the West Branch.

[18] The Grinder Room also contains an inoperable turbine-generator unit (Unit 2), which does not contribute to the development's rated capacity.

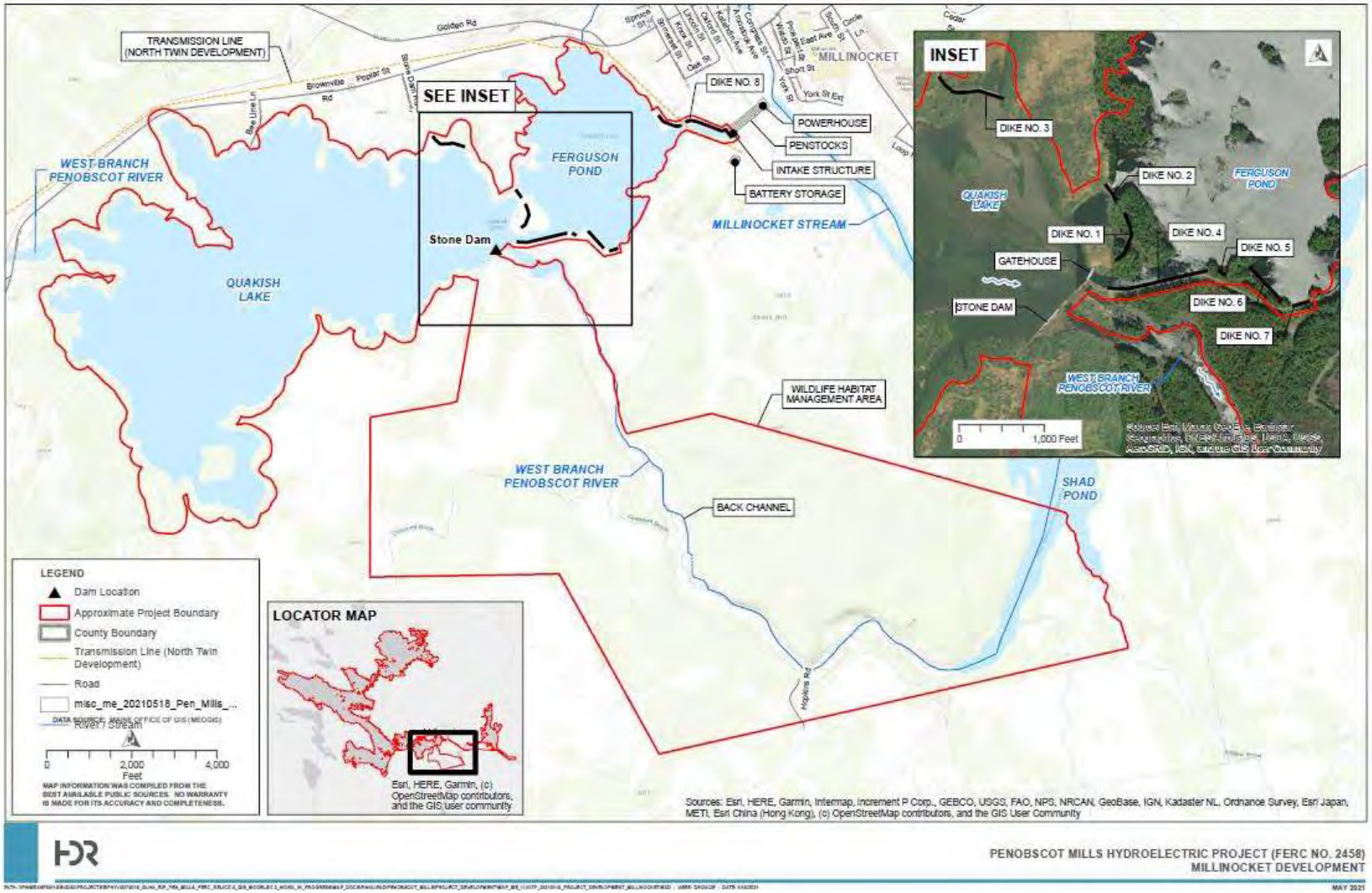



Figure 6. Millinocket Development facilities (source: PAD).

Power generated from Units 3, 4, 5, 6, and 7 is transmitted across Millinocket Stream via a 300-foot-long transmission line to a transformer in GLHA's Substation #1. Power generated from Units 1 and 8 is also transmitted across Millinocket Stream via a 300-foot-long transmission line to a second transformer in Substation #1.

**Dolby Development (figure 7)** – The 4.2-mile-long Dolby Pond has a surface area of 2,048 acres at a normal full pond elevation of 336.2 feet. Dolby Pond provides negligible storage. The 1,395-foot-long Dolby Dam is a concrete and earth-filled structure located at the outlet of Dolby Pond. The dam, which crosses the West Branch in a generally southwest-northwest direction, includes a 27-foot-long concrete abutment; four spillway sections with a total length of 521 feet; two 6-foot-long abutments; a 76-foot-wide waste gate; a 209-foot-wide intake with an integral powerhouse; and two contiguous earthen dikes, measuring 300 feet long and 250 feet long.

Water is withdrawn from Dolby Pond through a 23-foot-wide by 209-foot-long concrete intake structure with nine openings. Each opening is equipped with a headgate to control the flow of water to the turbines. Eight sets of trash racks, having a total length of 174 feet, extend across the upstream side of the intake. The trash racks for bays 2 through 4 have a clear bar spacing of 1-5/8 inches, and the trash racks for bays 5 through 8 have a clear bar spacing of 2-5/8 inches. The gate operators and trash rakes for bays 5 through 8 are housed in a 23-foot-wide by 121-foot-long concrete block building. Water flows from the intake to a 115-foot-wide by 167-foot-long powerhouse that houses four operable turbine-generator units (Units 5, 6, 7, and 8).[19] Three of the operable turbines are Inclined Kaplan units and one is a Fixed Blade unit, each connected to generators. The rated capacity of the four turbines is 17.049 MW, and the rated capacity of the four generators is 17.098 MW. Water exits the turbines through four tailrace bays and flows into a 189-foot-wide tailrace.

The power generated by the Dolby Development is transmitted to the grid via an adjacent substation that contains two transformers and a 2-mile-long transmission line that extends to GLHA's Substation #5 ***(also referred to as the Powersville Substation) located adjacent to the East Millinocket Development. Additionally, a second transmission line extends approximately 5 miles from the Dolby Substation to the former Millinocket Mill, but is currently out-of-service***.

[19] Units 1, 2, 3, and 4 in the Dolby Powerhouse are currently out-of-service, and do not contribute to the development's rated capacity.

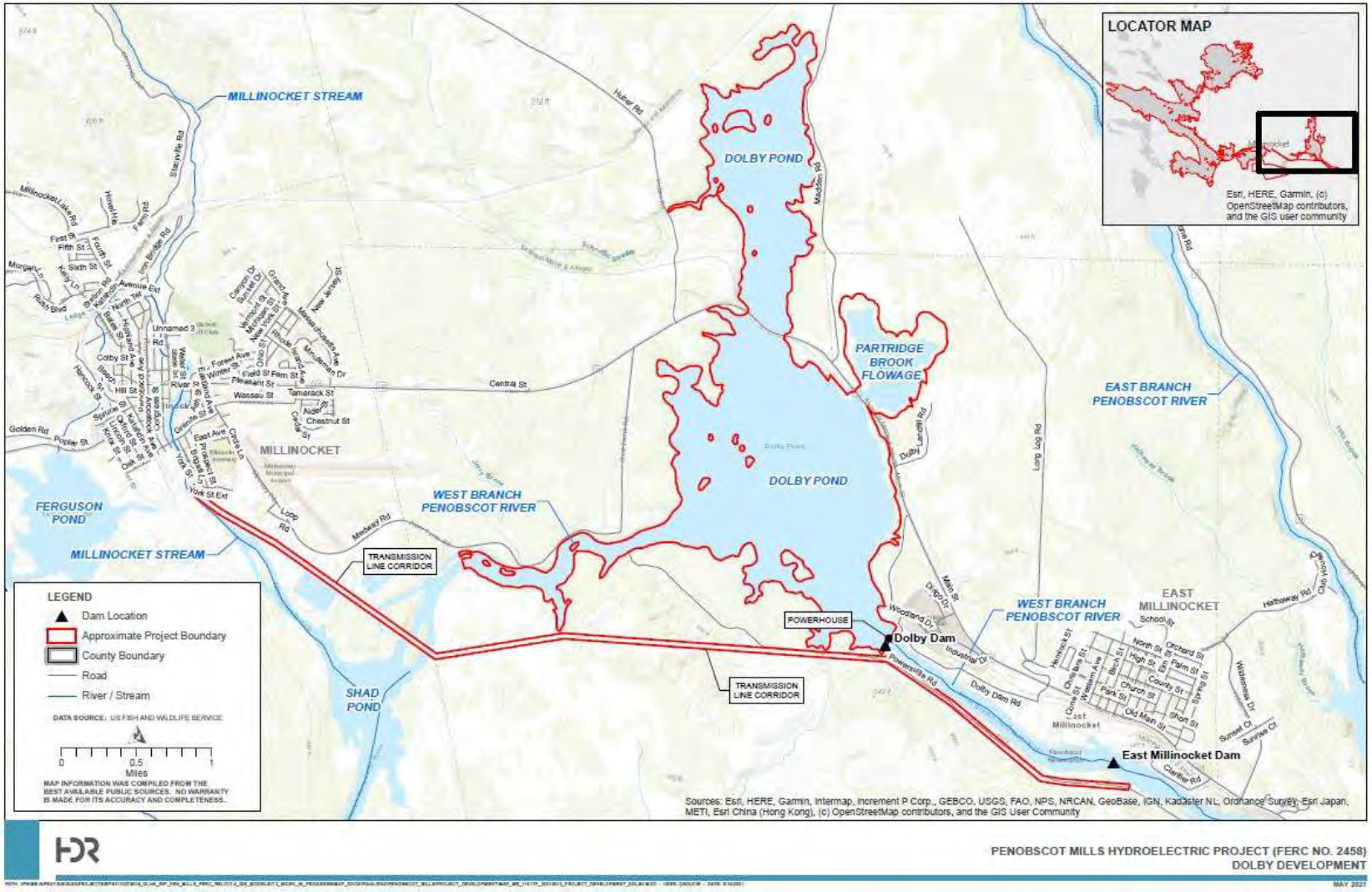



Figure 7. Dolby Development facilities (source: PAD).

**East Millinocket Development (figure 8)** – The East Millinocket Development is located at the former East Millinocket Mill, about 1.7 miles upstream of Black Bear Hydro Partners, LLC's Medway Hydroelectric Project No. 2666. The 1.9-mile-long East Millinocket impoundment extends upstream to the tailwater of the Dolby Development. The impoundment has a surface area of 128 acres at a normal full pond elevation of 287.2 feet and has negligible storage. The 717.5-foot-long East Millinocket Dam, which crosses the West Branch in a generally east-west direction, consists of a 116-foot-long earth embankment; a 212-foot-long spillway section; a 59-foot-wide waste gate; a 154-foot-long spillway section; a 7-foot-wide timber crib section; a 23-foot-wide sluice gate; and a 146.5-foot-wide intake structure integral with the powerhouse.

Water from the East Millinocket impoundment flows through a 146.5-foot-long by 54-foot-wide intake structure, containing 12, 9-foot by 11-foot gate openings. Each of 12 gate openings are equipped with a steel headgate connected to a hand-operated gate hoist that controls the flow of water into the intake. The intake is protected by trash racks that have a 1-1/4-inch clear bar spacing. From the intake, water flows into to six covered flumes in a 56-foot-wide by 146.5-foot-wide powerhouse. Each flume contains a horizontal Francis turbine connected to a generator. The rated capacity of the six turbines is 6.975 MW and the rated capacity of the six generators is 9.952 MW. Water exits the powerhouse and flows through a 1,050-foot-long tailrace (average width of 110 feet) to the West Branch.

The power generated by the East Millinocket Development is transmitted to the grid via two 6,900-volt buses, which are connected to a transformer that is part of Substation #3 located at the former East Millinocket Mill. From the transformer, power is transmitted to Substation #5 ***(also referred to as the Powersville Substation)*** via a ***2,000-foot-long*** transmission line.

**Battery Energy Storage System** – The Projects include two utility-scale battery energy storage sites that operate as a single Battery Energy Storage System. One of the battery storage sites is located at the Powersville Substation (within the transmission right-of-way for the Dolby and East Millinocket Developments). This battery storage site is sized at a capacity of 10 MW with a 2-hour duration (20 MWh total capacity). The second battery storage site is located within the Ripogenus Project's 115-kV (200-foot-wide) transmission line right-of-way adjacent to the Millinocket Substation #4 (partially within the Penobscot Mills Project boundary and partially within the Ripogenus Project boundary). This battery storage site is also sized at a capacity of 10 MW with a 2-hour duration (20 megawatt hours [MWh] total capacity). The Battery Energy Storage System has a total capacity of 20 MW for up to 2 hours (40 MWh total capacity).

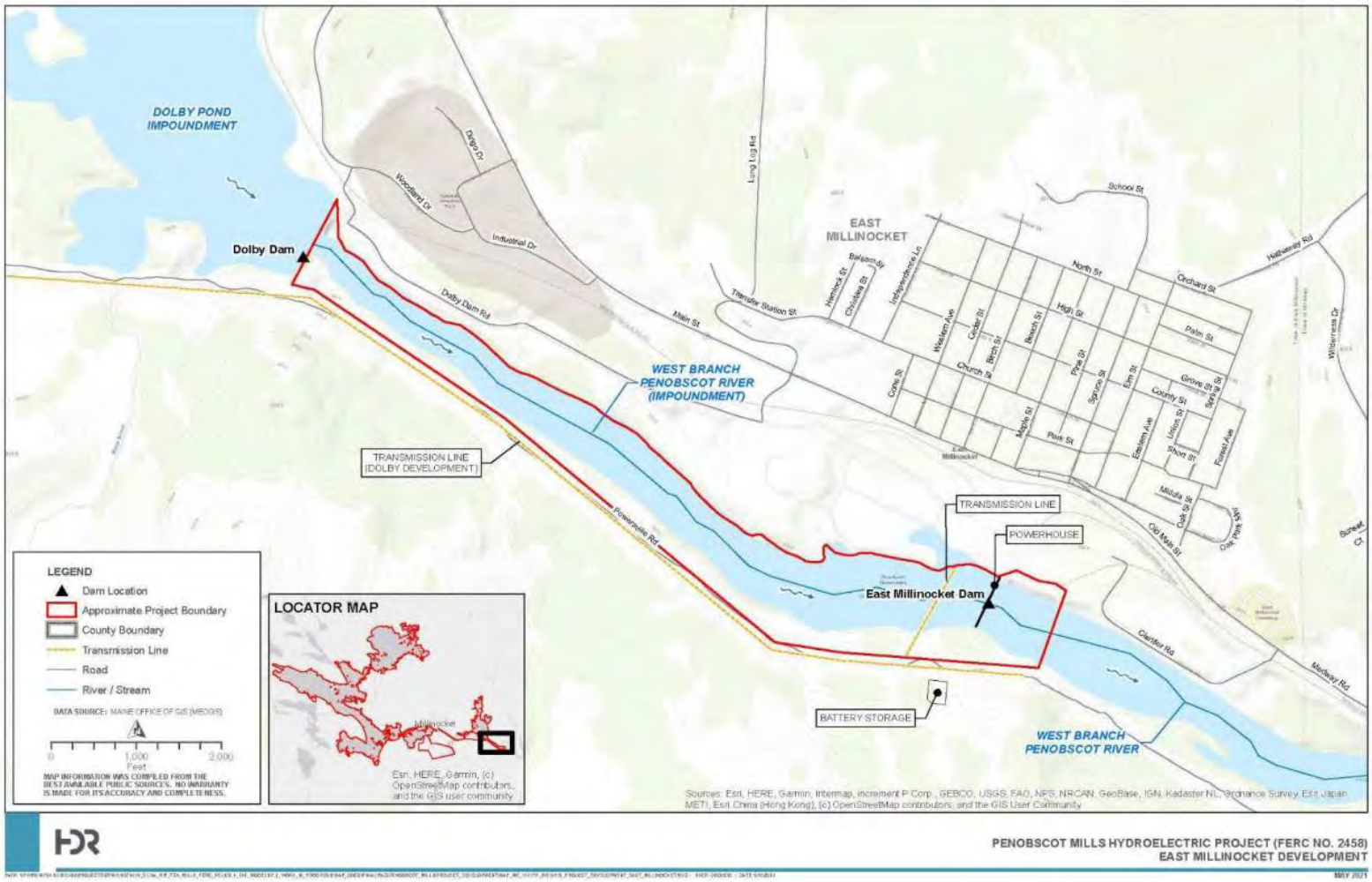



Figure 8. East Millinocket Development facilities (source: PAD).

### 3.1.2 Recreation Facilities

*RIPOGENUS PROJECT*

Ripogenus Project recreation facilities consist of a boat launch (Chesuncook Point Boat Launch), a boat put-in (Caribou Lake Put-In), 12 campsites (Chesuncook Lake Remote Campsites-10; Umbazooksus Stream Campsites-2), rafting put-in facilities (McKay Station Rafting Put-In Site), and a 0.75-mile-long trail (Upper Gorge Trail).

*PENOBSCOT MILLS PROJECT*

Penobscot Mills Project recreation facilities consist of six boat launches. The Millinockett Lake Public Boat Launch is located at the Millinocket Lake Storage Development. The Ambajejus Lake Boat Launch and South Twin Lake (Partridge Cove) Boat Launch are located at the North Twin Development. The Green Bridge Boat Launch is located ***downstream of North Twin Dam on the West Branch and within the Penobscot Mills Project boundary. It provides boating access both downstream to Quakish Lake (Millinocket impoundment) and upstream to North Twin Dam***. The Dead Man's Curve Boat Launch and Dolby Pond (Flowage) Boat Launch are located at the Dolby Development.

### 3.1.3 Project Operation

*RIPOGENUS PROJECT*

The Ripogenus Project is operated ***in accordance with its existing license,*** with an annual seasonal drawdown that allows for management of water levels and flows downstream of the project. The normal full pond elevation of the Ripogenus impoundment is 941.6 feet, with a maximum drawdown of 44 feet (based on operational limitations of the project). During normal operation and normal inflow years, the Ripogenus impoundment elevation is ***maintained at a target elevation of*** 941.6 feet during the summer months and is gradually drawn down starting in the fall, with a target low elevation of 913.6 feet by late winter, in anticipation of spring thaw and high flows. This operation results in a target seasonal drawdown of 28 feet. In the spring, the Ripogenus impoundment elevation rises based on inflows from the upstream Storage Project No. 2634, spring thaw, and precipitation, with the goal of reaching 941.6 feet by late spring. In coordination with the upstream Storage Project and the downstream Penobscot Mills Project, Ripogenus Project operators balance downstream flows and water levels to support flood control, public safety, dam safety, supplemental flows during seasonal low-flow periods, fish spawning and migration, recreation and whitewater boating, water quality, and generation needs.

GLHA also provides a minimum flow of 100 cubic feet per second (cfs) through sluice gates into the ***dewatered section of the West Branch downstream from Ripogenus Dam*** (Upper Gorge) from July 1 through September 30 and 12 cfs through leakage from Ripogenus Dam from October 1 through June 30. In addition, the project provides seasonally variable minimum flows downstream of McKay Station into the West Branch, according to the schedule in table 1, to facilitate drawdown of the North Twin impoundment, protect landlocked salmon spawning, and provide whitewater recreation flows. During failure of the generating units, the project releases 400 cfs.

Table 1. Minimum flows released from McKay Station into the West Branch. (Source: PAD).

| Date range | Minimum flow released |
|---|---|
| **Facilitate North Twin impoundment drawdown** | |
| September 16 through October 14 | 1,000 cfs |
| **Landlocked salmon flows** | |
| October 15 through November 15 | At least 1,422 cfs, or inflow, but not less than 1,300 cfs at any time.[a] |
| November 16 through June 7 | Greater than 1,422 cfs.[a] |
| **Whitewater recreation flows** | |
| May 1 through September 15 (8:30 AM - 5:00 PM) | **Normal hydrologic year:**<br>2,300 cfs on Saturdays and Sundays<br>2,200 cfs on Mondays and Fridays<br>2,000 cfs on Tuesdays through Thursdays<br>**Wet or dry hydrologic year:**<br>2,200 cfs on Saturdays and Sundays<br>2,000 cfs on Mondays and Fridays<br>1,800 cfs on Tuesdays through Thursdays |
| September 16 to October 1 (8:30 AM - 5:00 PM) | **Normal hydrologic year:**<br>2,300 cfs on Saturdays and Sundays<br>**Wet or dry hydrologic year:**<br>2,200 cfs on Saturdays and Sundays |
| June 8 to October 14 (5:00 PM - 8:30 AM) | 1,000 cfs |

[a] Actual flows are established each year in consultation with FWS and Maine DIFW.

GLHA also uses the Ripogenus Project to provide flows that are diverted to the Holbrook Side Channel from the West Branch.[20] Two pipes are used for this purpose. One is equipped with a valve that can be opened or closed to increase or reduce flows from the West Branch into the channel; the other has no valve to control flow. Flows from the channel re-enter the West Branch about 1,000 feet downstream from the pipes. Flows into the channel range from about 35 cfs to 65 cfs during normal operating conditions, depending on the amount of flow in the West Branch. On about June 1, GLHA closes the valve to reduce flow into the channel to enhance conditions for landlocked salmon and brook trout fry emergence and production. On about October 15, GLHA opens the valve to increase flow into the channel to enhance conditions for landlocked salmon and brook trout spawning.

*PENOBSCOT MILLS PROJECT*

The five developments that compose the Penobscot Mills Project are operated as an integrated system, primarily making use of flows received from the Ripogenus Project. The two ***storage*** developments (Millinocket Lake Storage and North Twin) are located upstream of the run-of-***release*** developments (Millinocket, Dolby, and East Millinocket). The North Twin impoundment receives flow from the Ripogenus Project. Flow from the Millinocket Lake Storage Development is either pumped into Ambajejus Lake (part of the North Twin impoundment) or flows down Millinocket Stream and enters the West Branch downstream from the Millinocket Development.

**Millinocket Lake Storage Development** – GLHA operates the Millinocket Lake Storage Development solely as a storage development, with no hydropower facilities. The development is operated as part of the larger West Branch system to manage flows and water levels within the West Branch and downstream in the Mainstem Penobscot River. GLHA maintains the water level in Millinocket Lake between elevations 470.0 feet and 480.0 feet (normal full pond elevation) by either pumping water via the development's pumping station to the North Twin impoundment (typically to maintain required impoundment levels within the North twin impoundment), or by releasing water into Millinocket Stream. In addition, GLHA releases a minimum flow of 60 cfs from Millinocket Lake into Millinocket Stream from May 1 through October 15, and a minimum flow of 60 cfs or inflow, whichever is less, from October 16 through April 30.

**North Twin Development** – Consistent with the operation of the Millinocket Lake Storage Development and the Ripogenus Project, the North Twin Development is

[20] The Holbrook Side Channel is a 1,400-foot-long channel located adjacent to the West Branch approximately 1.7 RM downstream from Ripogenus Dam.

operated to support flow management and water levels in the West Branch and the mainstem Penobscot River. The North Twin Development operates as a ***storage*** facility, with a normal full pond elevation of 491.92 feet. Pursuant to the current license, GLHA maintains the North Twin impoundment above elevation 488.42 feet (within 3.5 feet from normal full pond). From October 15 to the start of the spring freshet season, the impoundment elevation is gradually drawn down to an elevation of 479.42 feet (12 feet below normal full pond). However, during periods of high inflows, GLHA may use more than 12 feet of storage in the North Twin impoundment. From ice out to August 22, the impoundment is refilled and is maintained within plus or minus 0.5 foot of a target elevation of 490.42 feet (or within 1.5 feet from normal full pond elevation).

In addition to maintaining impoundment levels, GLHA releases a minimum flow of 3,000 cfs from the North Twin Development from August 22 through October 15, provided the impoundment elevation exceeds 488.42 feet. If the 488.42-foot elevation is not met, GLHA releases a minimum flow of 2,000 cfs from the North Twin Development to meet the 2,000-cfs minimum flow requirement at Shad Pond (located downstream from the Millinocket and Millinocket Lake Storage Developments).

The North Twin Development is equipped with a pool-and-weir fishway. GLHA maintains a stable impoundment elevation from May 1 through August 22 for recreation purposes, which also provides a suitable impoundment elevation for the fishway exit. In addition, GLHA provides an attraction flow of 3.5 cfs through an 8-inch-diamater gravity pipe that extends from the dam to the fishway entrance.

**Millinocket, Dolby, and East Millinocket Developments** – GLHA operates the Millinocket, Dolby, and East Millinocket Developments ***as*** run-of-***release facilities***, with typical impoundment fluctuations of 1 foot or less from the top of the flashboards when installed or crest of dam without flashboards. In addition, GLHA releases a minimum flow of 2,000 cfs through each development to the West Branch, as measured downstream from Shad Pond. ***The developments' generation*** and minimum flow ***releases*** are accomplished through use of the developments' turbines. If use of the turbines is not possible, GLHA uses the inflatable, rubber dam at Stone Dam at the Millinocket Development and waste gates at the Dolby and East Millinocket Development to support run-of-river operations.

**Battery Energy Storage System** – In 2020, GLHA installed a utility-scale Battery Energy Storage System at the Projects. One battery storage site is located at the Millinocket Substation #4 and the other is located the Powersville Substation. The Battery Energy Storage System is connected to the Project's transmission lines and collects power from the Projects at 34.5 kV and delivers it to the grid at 115 kV. The two battery storage sites can be isolated from the substations using breakers and switches, if

necessary. The system only charges from the hydroelectric facilities, and not from the grid. The system has not, and would not, change how the Projects are operated.

### 3.1.4 Proposed Environmental Measures

GLHA proposes to continue to operate and maintain the Ripogenus Project and the Penobscot Mills Project as required by their current licenses. GLHA does not propose any new development or changes in project operation. The environmental measures that are currently proposed by GLHA are described below.

**Aquatic Resources**

- Continue to provide seasonally variable minimum flows from Ripogenus Dam into Upper Gorge and from McKay Station into the West Branch as described above in table 1.

- Continue to provide flows to the Holbrook Side Channel for landlocked salmon and brook trout spawning and rearing as describe above in table 1.

- Continue to provide the seasonal minimum flows described above from Millinocket Lake Storage Dam into Millinocket Stream.

- Continue to provide the minimum flows described above from North Twin Dam, as well as the Millinocket, Dolby, and East Millinocket Developments to the West Branch.

**Wildlife and Botanical Resources**

- Continue to deploy artificial nesting platforms for the Common Loon and other aquatic birds in the Ripogenus impoundment.

- Continue to implement and maintain the wildlife enhancement measures included in the Wildlife management Plan required by Article 412 of the current license for the Wildlife Management Area located adjacent to the ***West Branch*** downstream from Stone Dam.

**Recreation Resources**

- Continue to operate and maintain the 11 recreation sites described above for the Projects.

- Continue to collect recreation use information every 6 years for the project recreation sites.

- Continue to provide whitewater boating flows downstream from McKay Station, as described above in table 1.

- Update the existing Recreation Plans for the Projects as part of the license applications.

**Cultural Resources**

- Develop updated Historic Properties Management Plans for the Projects.

## 3.2 DAM SAFETY

It is important to note that dam safety constraints may exist and should be taken into consideration in the development of proposals and alternatives considered in the pending proceedings. For example, proposed modifications to dam structures could impact the integrity of the dams' structures. As the proposals and alternatives are developed, the applicant must evaluate the effects and ensure that the Projects would meet the Commission's dam safety criteria found in Part 12 of the Commission's regulations and the Engineering Guidelines (http://www.ferc.gov/industries/hydropower/safety/guidelines/eng-guide.asp).

## 3.3 ALTERNATIVES TO THE PROPOSED ACTIONS

Commission staff will consider and assess all alternative recommendations for operational or facility modifications, as well as protection, mitigation, and enhancement measures identified by the Commission, the agencies, Native-American tribes, NGOs, and the public.

## 3.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

At present, we propose to eliminate the following alternatives from detailed study in the NEPA document.

### 3.4.1 Federal Government Takeover

In accordance with § 16.14 of the Commission's regulations, a federal department or agency may file a recommendation that the United States exercise its right to take over

a hydroelectric power project with a license that is subject to sections 14 and 15 of the FPA.[21] We do not consider federal takeover to be a reasonable alternative. Federal takeover of the Projects would require congressional approval. While that fact alone would not preclude further consideration of this alternative, there is currently no evidence showing that federal takeover should be recommended to Congress. No party has suggested that federal takeover would be appropriate, and no federal agency has expressed interest in operating the Projects.

### 3.4.2 Non-power License

A non-power license is a temporary license the Commission would terminate whenever it determines that another governmental agency is authorized and willing to assume regulatory authority and supervision over the lands and facilities covered by the non-power license. At this time, no governmental agency has suggested a willingness or ability to take over the Projects. No party has sought a non-power license for either project, and we have no basis for concluding that the Ripogenus and Penobscot Mills Projects should no longer be used to produce power. Thus, we do not consider a non-power license a reasonable alternative to relicensing the projects.

### 3.4.3 Project Decommissioning

As the Commission has previously held, decommissioning is not a reasonable alternative to relicensing in most cases.[22] Decommissioning can be accomplished in different ways depending on the project, its environment, and the particular resource needs.[23] For these reasons, the Commission does not speculate about possible decommissioning measures at the time of relicensing, but rather waits until an applicant actually proposes to decommission a project, or a participant in a relicensing proceeding demonstrates that there are serious resource concerns that cannot be addressed with

[21] 16 U.S.C. §§ 791(a)-825(r).

[22] *See, e.g., Eagle Crest Energy Co*., 153 FERC ¶ 61,058, at P 67 (2015); *Public Utility District No. 1 of Pend Oreille County*, 112 FERC ¶ 61,055, at P 82 (2005); *Midwest Hydro, Inc*., 111 FERC ¶ 61,327, at PP 35-38 (2005).

[23] In the unlikely event that the Commission denies relicensing a project or a licensee decides to surrender an existing project, the Commission must approve a surrender "upon such conditions with respect to the disposition of such works as may be determined by the Commission." 18 C.F.R. § 6.2 (2020). This can include simply shutting down the power operations, removing all or parts of the project (including the dam), or restoring the site to its pre-project condition.

appropriate license measures and that make decommissioning a reasonable alternative.[24] GLHA does not propose decommissioning, nor does the record to date demonstrate there are serious resource concerns that cannot be mitigated if the projects are relicensed; as such, there is no reason, at this time, to include decommissioning as a reasonable alternative to be evaluated and studied as part of staff's NEPA analysis.

# 4.0 SITE-SPECIFIC RESOURCE ISSUES

## 4.1 RESOURCE ISSUES

In this section, we present a preliminary list of environmental issues to be addressed in the NEPA document. We identified these issues, which are listed by resource area, by reviewing the PAD and the Commission's record for the Ripogenus Project and Penobscot Mills Project. The environmental issues identified apply to both projects, unless otherwise specified in the issue description. This list is not intended to be exhaustive or final, but contains those issues raised to date that could have substantial effects. After the scoping process is complete, we will review the list and determine the appropriate level of analysis needed to address each issue in the NEPA document.

### 4.1.1 Geologic and Soils Resources

- Effects of continuing to operate the Projects on shoreline erosion in the impoundments.

- ***Effects of flow diversion and dewatering on sediment transport in the natural river channel's of the West Branch downstream from Ripogenus Dam and Stone Dam.***

### 4.1.2 Water and Aquatic Resources

- ***Effects of changes in historical project operation (based on generation records) on baseline flow patterns in the West Branch, and how such changes may affect aquatic resources in the vicinity of the Projects and***

[24] *See* generally *Project Decommissioning at Relicensing*; Policy Statement, FERC Stats. & Regs., Regulations Preambles (1991-1996), ¶ 31,011 (1994); *see also City of Tacoma, Washington,* 110 FERC ¶ 61,140 (2005) (finding that unless and until the Commission has a specific decommissioning proposal, any further environmental analysis of the effects of project decommissioning would be both premature and speculative).

***the West Branch, including the effect on fish migration timing and passage on the mainstem of the Penobscot River.***

- Effects of continuing to operate the Projects ***under the existing Water Use Plan and alternatives to that plan,*** on water quantity and flow in the West Branch ***and mainstem of the Penobscot River***, including effects on impoundment water levels***, the impoundments' ecosystems and biological communities, and downstream flow releases and*** flooding.

- Effects of continuing to operate the Projects***, including the flow release elevation at Ripogenus Dam,*** on DO concentrations and water temperature in the project impoundments and project-affected reaches downstream from project dams and powerhouses (e.g., Upper Gorge ***and the West Branch downstream from McKay Station;*** Holbrook Side Channel; ***the West Branch downstream from Stone Dam;*** Millinocket Stream***; and the mainstem Penobscot River***).

- Effects of drawdowns ***and fluctuating lake levels within*** the Ripogenus, North Twin, and Millinocket Lake impoundments on ***littoral habitat and associated aquatic communities, as well as*** access to impoundment tributaries for resident fish (e.g., landlocked salmon and rainbow smelt).

- ***Effects of operating the Ripogenus Project on lake whitefish populations in the Ripogenus impoundment.***

- ***Effects of operation of the Projects on aquatic insects, crayfish, and other macroinvertebates in the project impoundments and the West Branch (e.g., the Upper Gorge, Holbrook Side Channel, downstream from McKay Station, the West Branch downstream from Stone Dam, and Millinocket Stream).***

- Effects of continuing to operate the Projects on aquatic ***(littoral)*** habitat for resident ***and migratory*** fish and freshwater mussel species ***(as appropriate)*** in the project impoundments and project-affected reaches downstream from project dams and powerhouses (e.g., the Upper Gorge, Holbrook Side Channel, ***West Branch downstream from Stone Dam***, ***and*** Millinocket Stream).

- ***Effects of project flow diversion and dewatering of the river channel downstream from Ripogenus Dam and Stone Dam on fish populations and movement, aquatic habitat, and river connectivity.***

- ***Effects of the pumping operation at Millinocket Lake Storage Dam on flow releases into Millinocket Stream, including flow variability in relation to water quality maintenance, aquatic habitat, and recreation.***

- Effects of continuing to operate the Projects on upstream and downstream passage of American eels in the West Branch.

- Effects of continuing to operate the Projects on the movement of sea-run Atlantic salmon and alosines (American shad and river herring) in the West Branch and mainstem Penobscot River.

- ***Effects of potentially establishing invasive species in the Project impoundments and the West Branch from any fish passage for sea-run species.***

- Effects of continuing to operate the Projects on essential fish habitat for Atlantic salmon.

- Effects of continuing to operate the Projects on fish impingement, entrainment, and survival at the Projects' developments.

- ***Effects of continuing to operate the Projects on smelt abundance and downstream drift in the West Branch.***

- Effects of continuing to operate the Projects on state-protected aquatic species (e.g., brook floater, yellow lampmussel, and tidewater mucket).

### 4.1.3 Wildlife and Botanical Resources

- ***Effects of continuing to operate the Projects on wildlife resources within the project impoundments and the West Branch, including the effects of the drawdowns and low lake levels on riparian vegetation and associated wildlife around the Ripogenus Impoundment.***

- Effects of continuing to operate the Projects on wetlands, ***littoral*** and riparian habitat in, and along, the project impoundments, ***and the West Branch***.

- Effects of continuing to operate the Projects on state-protected wildlife and plant species (e.g., little brown bat, eastern small-footed bat, wood turtle, ***etc.***), ***including Species of Special Concern and Significant Wildlife Habitat listed under Maine's Natural Resources Protection Act and potentially in the project area***.

### 4.1.4 Threatened and Endangered Species

- Effects of continuing to operate and maintain the Projects on: (1) the federally threatened Canada lynx and its designated habitat and northern long-eared bat; and (2) the federally endangered Gulf of Maine Distinct Population Segment Atlantic salmon and its designated critical habitat***, including movement, restoration/recovery, and passage***.[25]

### 4.1.5 Recreation, Land Use, *and Aesthetics*

- Effects of continuing to operate and maintain the Projects on the project recreation facilities and their use, as well as ***(1) angling and*** recreational ***access/***opportunities on ***the project impoundments (including Caribou, Chesuncook, and Ripogenus Lakes) and*** the West Branch***; (2) public safety of recreational users of the lakes; (3) water supply to properties around Ripogenus Impoundment; and (4) educational opportunities***.

- Adequacy of existing project recreational facilities to meet existing and future recreational demand and capacity requirements.

- Adequacy of existing whitewater flows and access on the West Branch downstream from McKay Station***, the West Branch between Quakish Lake and Dolby Pond, and on Millinocket Stream***.

- ***Effects of continuing to operate and maintain the Projects, including the effects of the drawdowns and low lake levels, on aesthetic resources in the Projects' areas.***

[25] This list is derived from our July 28, 2021 search of the U.S. Fish and Wildlife Service's ECOS-IPaC website.

- ***Effects of continuing to operate the Projects on angling opportunities for landlocked Atlantic salmon and brook trout in the West Branch, including the river reach downstream from Ripogenus Dam.***

- ***Effects of flow releases in the Upper Gorge and whitewater releases from McKay Station on the brook trout fishery in the West Branch.***

### 4.1.6 Cultural Resources

- Effects of continuing to operate and maintain the Projects on ***historic and archaeological resources within the APE*** that are included in, or eligible for inclusion in, the National Register of Historic Places.

### *4.1.7 Socio-Economic Resources*

- ***Effects of the Projects' operation and maintenance on minority and low-income populations, including members of Native-American tribes.***

- ***Effects of the Projects' operation and maintenance on local, regional, and tribal economies.***

### 4.1.*8* Developmental Resources

- Effects of proposed or recommended environmental measures on the Projects' generation and economics.

## 5.0 PROPOSED STUDIES

GLHA's initial study proposals are identified by resource area for the Ripogenus Project (table 2) and the Penobscot Mills Project (table 3). Detailed information on GLHA's initial study proposals can be found in Section 6.2, *Proposed Studies and Information Gathering Associated with Identified Issues*, of the PAD. Further studies may need to be added to this list based on comments provided to the Commission and GLHA from ***agencies, Native-American Tribes, and interested stakeholders during the study planning process***.

**Table 2**. GLHA's initial study proposals for the Ripogenus Project. (Source: PAD).

| Resource area | Proposed Study |
|---|---|
| **Aquatic Resources** | |
| *Water Quality* | Collect water quality data in project impoundment, Upper Gorge, and downstream of McKay Station to inform FERC relicensing and the water quality certification process. |
| *Macroinvertebrate Community* | Conduct a survey to characterize the macroinvertebrate community downstream from McKay Station. |
| **Recreation, Land Use, and Aesthetics** | |
| *Recreation Facilities* | Characterize the existing recreation facilities in the project boundary, including their condition. |

**Table 3**. GLHA's initial study proposals for the Penobscot Mills Project. (Source: PAD).

| Resource area | Proposed Study |
|---|---|
| **Aquatic Resources** | |
| *Water Quality* | Collect water quality data in the impoundments and riverine/tailwater areas of each development to inform FERC relicensing and the water quality certification process. |
| *Macroinvertebrate Community* | Conduct a survey to characterize the macroinvertebrate community in each of the tailwater and riverine reaches. |
| *Aquatic Habitat* | Map and characterize aquatic and riparian mesohabitat types in the ***West Branch downstream from Stone Dam (***Millinocket Development***)*** under the existing flow regime. |
| **Recreation, Land Use, and Aesthetics** | |

| Resource area | Proposed Study |
|---|---|
| *Recreation Facilities* | Characterize the existing recreation facilities in the project boundary, including their condition. |

## 6.0 EA PREPARATION SCHEDULE

The decision on whether to prepare an EA or EIS will be determined after the license application is filed and we fully understand the scope of effects and measures under consideration. ***Nonetheless, at this time, we anticipate the need to prepare a draft and final NEPA document. The draft NEPA document will be sent to all persons and entities on the Commission's service and mailing lists for the Projects.*** The NEPA document will include our recommendations for operating procedures, as well as PM&E measures that should be part of any license issued by the Commission. ***All recipients will then have 30 to 45 days to review the EA, or 60 days to review the EIS, and file written comments with the Commission. All comments on the draft NEPA document filed with the Commission will be considered in preparation of the final NEPA document.***

***The major milestones, including those for preparing the NEPA document, are as follows:***

| ***Major Milestone*** | ***Target Date*** |
|---|---|
| ***License Application Filed*** | ***September 30, 2024*** |
| ***Ready for Environmental Analysis Notice Issued*** | ***November 29, 2024*** |
| ***Deadline for Filing Comments, Recommendations, and Agency Terms and Conditions/Prescriptions*** | ***January 28, 2025*** |
| ***Drat NEPA Document Issued*** | ***August 15, 2025*** |
| ***Comments on Draft NEPA Document Due*** | ***September 14, 2025*** |
| ***Deadline for Filing Modified Agency Recommendations*** | ***November 13, 2025*** |
| ***Final NEPA Document Issued*** | ***February 3, 2026*** |

***If Commission staff determines that there is a need for additional information or additional studies, the issuance of the Ready for Environmental Analysis notice could be delayed. If this occurs, all subsequent milestones would be delayed by the time allowed for the licensee to respond to the Commission staff's request.***

A copy of GLHA's process plan for developing the license application is attached as Appendix ***A*** to this ***SD2***.

## *7.0 PROPOSED NEPA DOCUMENT OUTLINE*

***The preliminary outline for the Ripogenus and Penobscot Mills Projects' NEPA document is as follows:***

***TABLE OF CONTENTS***
***LIST OF APPENDICES***
***LIST OF FIGURES***
***LIST OF TABLES***
***ACRONYMS AND ABBREVIATIONS***

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    - ***1.1 Application***
    - ***1.2 Purpose of Action and Need for Power***
    - ***1.3 Statutory and Regulatory Requirements***
        - ***1.3.1 Federal Power Act***
            - ***1.3.1.1 Section 18 Fishway Prescriptions***
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        - ***1.3.2 Clean Water Act***
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    - ***2.1 No-action Alternative***
    - ***2.2 Applicant's Proposal***
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        - ***2.2.2 Penobscot Mills Project***
    - ***2.3 Staff Alternative***
        - ***2.3.1 Ripogenus Project***
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    - ***2.5 Other Alternatives (as appropriate)***
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        - ***2.6.1 Federal Government Takeover of the Projects***
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*2.6.3 Retiring the Projects*
*3. ENVIRONMENTAL ANALYSIS*
*3.1 General Description of the River Basin*
*3.2 Proposed Action and Action Alternatives*
*3.2.1 Geology and Soils*
*3.2.2 Water Resources*
*3.2.3 Fish and Aquatic Resources*
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*6. FINDING OF NO SIGNIFICANT IMPACT [OR SIGNIFICANT IMPACT]*
*7. LITERATURE CITED*
*8. LIST OF PREPARERS*

*APPENDICES*
*A – Draft License Conditions Recommended by Staff*

## 8.0 COMPREHENSIVE PLANS

Section 10(a)(2) of the FPA, 16 U.S.C. Section 803(a)(2)(A), requires the Commission to consider the extent to which a project is consistent with federal and state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by a project. The staff has preliminarily identified and reviewed the plans listed below that may be relevant to the Projects. Agencies are requested to review this list and inform the Commission staff of any changes. If there are other comprehensive plans that should be considered for this list that are not on file with the Commission, or if there are more recent versions of the plans already listed, they can be filed for consideration with the Commission according to 18 CFR 2.19 of the Commission's regulations. Please

follow the instructions for filing a plan at http://www.ferc.gov/industries/hydropower/gen-info/licensing/complan.pdf.

The following is a list of comprehensive plans currently on file with the Commission that may be relevant to the Projects:


Atlantic States Marine Fisheries Commission. 1999. Amendment 1 to the Interstate Fishery Management Plan for shad and river herring. (Report No. 35). April 1999.

Atlantic States Marine Fisheries Commission. 2000. Interstate Fishery Management Plan for American eel (*Anguilla rostrata*). (Report No. 36). April 2000.

Atlantic States Marine Fisheries Commission. 2000. Technical Addendum 1 to Amendment 1 of the Interstate Fishery Management Plan for shad and river herring. February 9, 2000.

Atlantic States Marine Fisheries Commission. 2008. Amendment 2 to the Interstate Fishery Management Plan for American eel. Arlington, Virginia. October 2008.

Atlantic States Marine Fisheries Commission. 2009. Amendment 2 to the Interstate Fishery Management Plan for shad and river herring. Arlington, Virginia. May 2009.

Atlantic States Marine Fisheries Commission. 2010. Amendment 3 to the Interstate Fishery Management Plan for shad and river herring, Arlington, Virginia. February 2010.

Atlantic States Marine Fisheries Commission. 2013. Amendment 3 to the Interstate Fishery Management Plan for American eel. Arlington, Virginia. August 2013.

Atlantic States Marine Fisheries Commission. 2014. Amendment 4 to the Interstate Fishery Management Plan for American eel. Arlington, Virginia. October 2014.

Maine Atlantic Sea-Run Salmon Commission. 1984. Strategic plan for management of Atlantic salmon in the State of Maine. Augusta, Maine. July 1984.

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Maine Department of Conservation. 1982. Maine Rivers Study-final report. Augusta, Maine. May 1982.

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## 9.0 MAILING LISTS

The lists below are the Commission's official mailing lists for the Projects. If you want to receive future mailings for these proceedings and are not included in the lists below, please send your request by email to efiling@ferc.gov, or by mail to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 888 First Street, N.E., Room 1A, Washington, DC 20426. Submissions sent via any other carrier must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 12225 Wilkins Avenue, Rockville, Maryland 20852. All written and emailed requests to be added to the mailing lists must clearly identify the following on the first page, as appropriate: **Ripogenus Hydroelectric Project (P-2572-133)** and/or **Penobscot Mills Hydroelectric Project (P-2458-247).** You may use the same method if requesting removal from the mailing lists below.

Register online at http://www.ferc.gov/docs-filing/esubscription.asp to be notified via email of new filings and issuances related to these Projects or other pending projects. For assistance, please contact FERC Online Support at Mailto:FERCOnlineSupport@ferc.gov, or toll free at 1-866-208-3676, or for TTY, (202) 502-8659.

**Ripogenus Project Mailing List**

| | |
|---|---|
| John T. Eddins<br>Advisory Council on Historic Preservation<br>401 F Street N.W. Suite 308<br>Washington, DC 20001-2637 | Kevin Richard Colburn<br>National Stewardship Director<br>American Whitewater<br>1035 Van Buren Street<br>Missoula, MT 59802 |
| P. Andrew Hamilton<br>Eaton, Peabody, Bradford & Veague, P.A.<br>PO Box 1210<br>Bangor, ME 04402-1210 | John E. Rouleau<br>Chairman<br>Town of East Millinocket<br>53 Main St<br>East Millinocket, ME 04430-1126 |
| Vernon E. Haines<br>Fin and Feather Club<br>PO Box 123<br>Millinocket, ME 04462-0123 | John A. O'Leary<br>Great Bay Hydroelectric Associates<br>76 Thatcher St<br>Westwood, MA 02090-2527 |
| Kathy Davis Howatt<br>Hydropower Coordinator<br>Maine Department of Environmental Protection<br>17 State House Station<br>Augusta, ME 04333-0017 | John Perry<br>Environmental Coordinator<br>Maine Department of Inland Fisheries and Wildlife<br>284 State Street<br>Augusta, ME 04333-0041 |

| | |
|---|---|
| Gail Wippelhauser<br>Marine Resources Scientist<br>Maine Department of Marine Resources<br>21 State House Station<br>Augusta, ME 04333 | Kelly Maloney<br>Brookfield Renewable<br>Manager, Licensing and Compliance<br>150 Main Street<br>Lewiston, MAINE 04240 |
| Matthew Manahan<br>Attorney<br>Pierce Atwood LLP<br>Merrill's Wharf<br>254 Commercial Street<br>Portland, ME 04101 | Martin Eisenstein<br>Brann & Isaacson<br>PO Box 3070<br>Lewiston, ME 04243-3070 |
| Executive Director<br>Maine Audubon Society<br>20 Gilsland Farm Rd<br>Falmouth, ME 04105-2100 | Patrick McTeague<br>McTeague, Higbee, Case, Cohen,<br>Whitney & Toker, P.A.<br>PO Box 5000<br>Topsham, ME 04086-5000 |
| Erich Veyhl<br>Maine Conservation Rights Institute<br>24 Orchard Rd<br>Concord, MA 01742-3202 | Steven Tuckerman<br>Maine Flow<br>67 Litchfield Ave<br>Rutland, VT 05701-3511 |
| Richard E. Hill<br>Maine Professional Guides Association<br>55 Morrison Hill Rd<br>Wilton, ME 04294-4040 | Director<br>Maine Professional River Outfitters<br>PO Box 669<br>Millinocket, ME 04462-0669 |
| Eric Givens<br>Maine Sporting Camp Association<br>PO Box 119<br>Millinocket, ME 04462-0119 | Peter L. Pray<br>Pray’s Big Eddy Campground, Inc.<br>PO Box 548<br>Millinocket, ME 04462-0548 |
| Thomas C. Nannery<br>Sportsman’s Alliance of Maine<br>RR 1 Box 1174<br>Augusta, ME 04330-9801 | U.S. Army Corps of Engineers<br>Divisional Office, Regulatory<br>696 Virginia Rd<br>Concord, MA 01742-2718 |
| Jay Clement<br>U.S. Army Corps of Engineers<br>675 Western Avenue<br>Manchester, ME 04351 | Andrew Tittler<br>Attorney-Advisor<br>U.S. Department of Interior<br>15 State St.<br>8th Floor<br>Boston, MA 02109-3502 |

| | |
|---|---|
| U.S. National Park Service<br>North Atlantic Region<br>15 State St<br>Boston, MA 02109-3502 | Fred Miller<br>President<br>United Plant Guard Workers of America<br>119 Wheaton Rd<br>Dover Foxcroft, ME |

**Penobscot Mills Project Mailing List**

| | |
|---|---|
| John T Eddins<br>Advisory Council on Historic Preservation<br>401 F Street N.W. Suite 308<br>Washington, DC 20001-2637 | Kevin Richard Colburn<br>National Stewardship Director<br>American Whitewater<br>1035 Van Buren Street<br>Missoula, MT 59802 |
| P. Andrew Hamilton<br>Eaton, Peabody, Bradford & Veague, P.A.<br>PO Box 1210<br>Bangor, ME 04402-1210 | John E. Rouleau<br>Chairman<br>Town of East Millinocket<br>53 Main St<br>East Millinocket, ME 04430-1126 |
| Vernon E. Haines<br>Fin and Feather Club<br>PO Box 123<br>Millinocket, ME 04462-0123 | John A. O'Leary<br>Great Bay Hydroelectric Associates<br>76 Thatcher St<br>Westwood, MA 02090-2527 |
| Kathy Davis Howatt<br>Hydropower Coordinator<br>Maine Department of Environmental Protection<br>17 State House Station<br>Augusta, ME 04333-0017 | John Perry<br>Environmental Coordinator<br>Maine Department of Inland Fisheries and Wildlife<br>284 State Street, 41 SHS<br>Augusta, ME 04333-0041 |
| Gail Wippelhauser<br>Marine Resources Scientist<br>Maine Department of Marine Resources<br>21 State House Station<br>Augusta, ME 04333 | Kelly Maloney<br>Brookfield Renewable<br>Manager, Licensing and Compliance<br>150 Main Street<br>Lewiston, ME 04240 |
| Matthew Manahan<br>Attorney, Pierce Atwood LLP<br>Merrill's Wharf<br>254 Commercial Street<br>Portland, ME 04101 | Jeff Russell<br>Bloomer Russell Beaupain<br>175 Exchange Street<br>Suite 200<br>Bangor, ME 04401 |

| | |
|---|---|
| Executive Director<br>Maine Audubon Society<br>20 Gilsland Farm Rd<br>Falmouth, ME 04105-2100 | Patrick McTeague<br>McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A.<br>PO Box 5000<br>Topsham, ME 04086-5000 |
| Erich Veyhl<br>Maine Conservation Rights Institute<br>24 Orchard Rd<br>Concord, MA 01742-3202 | Bryant Davis<br>President<br>Fin and Feather Club of Maine<br>PO Box 123<br>Millinocket, ME 04462 |
| Richard E. Hill<br>Maine Professional Guides Association<br>55 Morrison Hill Rd<br>Wilton, ME 04294-4040 | John Dicentes<br>President<br>International Assn of Machinists, et al.<br>64 Congress St<br>Millinocket, ME 04462-1312 |
| Eric Givens<br>Maine Sporting Camp Association<br>PO Box 119<br>Millinocket, ME 04462-0119 | Maine Department of Conservation<br>22 State House Sta<br>Augusta, ME 04333-0022 |
| Maine Department of Inland Fisheries and Wildlife<br>41 State House Station<br>284 State Street<br>Augusta, ME | U.S. Army Corps of Engineers<br>Divisional Office, Regulatory<br>696 Virginia Rd<br>Concord, MA 01742-2718 |
| Jay Clement<br>U.S. Army Corps of Engineers<br>675 Western Avenue<br>Manchester, ME 04351 | Andrew Tittler<br>Attorney-Advisor<br>U.S. Department of Interior<br>15 State St., 8th Floor<br>Boston, MA 02109-3502 |
| U.S. National Park Service<br>North Atlantic Region<br>15 State St<br>Boston, MA 02109-3502 | Fred Miller<br>President<br>United Plant Guard Workers of America<br>119 Wheaton Rd<br>Dover Foxcroft, ME |
| Maine Department of Marine Resources<br>Hallowell Annex-Baker Building<br>State House Station 21<br>Augusta, ME 04333-0001 | Kathleen Leyden<br>Director, Maine Coastal Program<br>Maine Department of Agriculture, Cons. & Forestry<br>93 State House Station<br>Augusta, ME 04333-0038 |

| | |
|---|---|
| Director<br>Maine Department of Economic and Community<br>Development Energy Conservation Div.<br>59 State House Sta.<br>Augusta, ME 04333-0059 | Maine Historic Preservation Commission<br>Environmental Review Coord.<br>55 Capitol St<br>65 State House Station<br>Augusta, ME 04333-0065 |
| Maine Office of Attorney General<br>State House Station 6<br>Augusta, ME 04330 | Director<br>Maine Professional River Outfitters<br>PO Box 669<br>Millinocket, ME 04462-0669 |
| Maine State Extension Service<br>University of Maine<br>102 Libby Hall<br>Orono, ME 04469-0001 | Director<br>Maine Soil & Water Conservation Comm<br>Station #28<br>Deering Bldg., AMHI Complex<br>Augusta, ME 04333-0001 |
| Town of Millinocket<br>197 Penobscot Ave.<br>Millinocket, ME 04462-1430 | NOAA<br>NEPA Coordinator<br>Office of Program Planning & Integration<br>1315 East-West Highway<br>Silver Spring, MD 20910 |
| Board of County Commissioners<br>County of Penobscot<br>97 Hammond St<br>Bangor, MAINE 04401-4913 | John McDevitt<br>Save our Scenic Lakes Association<br>5 Pleasant St.<br>Burlington, MA 01803-2726 |
| Harold Peterson<br>Natural Resources Officer<br>Bureau of Indian Affairs<br>545 Marriott Drive Ste 700<br>Nashville, TN 37214 | Amanda Bossie<br>Office of the Solicitor<br>U.S. Department of Interior<br>INC000000251348<br>Boston, MA 02109 |
| Director<br>U.S. Environmental Protection Agency<br>Office of Ecosystem Protection<br>Water Quality Branch<br>5 Post Office Sq, Ste 100<br>Boston, MA 02109-3912 | Kevin Mendik, ESQ<br>NPS Hydro Prgm Coord<br>U.S. National Park Service<br>15 State Street<br>10th Floor<br>Boston, MA 02109 |

**APPENDIX A**
**RIPOGENUS PROJECT AND PENOBSCOT MILLS PROJECT PROCESS PLAN AND SCHEDULE**

Shaded milestones are unnecessary if there are no study disputes. If the due date falls on a weekend or holiday, the due date is the following business day. Early filings or issuances will not result in changes to these deadlines.

| Responsible Party | Pre-Filing Milestone | Date | FERC Regulation |
|---|---|---|---|
| Licensees | Issue Public Notice for NOI/PAD | 6/11/21 | 5.3(d)(2) |
| Licensees | File NOI/PAD | 6/11/21 | 5.5, 5.6 |
| FERC | Tribal Meetings, if needed | TBD | 5.7 |
| FERC | Issue Notice of Commencement of Proceeding and Scoping Document 1 | 8/10/21 | 5.8 |
| FERC | Scoping Meetings | 9/9/21 | 5.8(b)(viii) |
| All Stakeholders | File Comments on PAD/Scoping Document 1 and Study Requests | 10/9/21 | 5.9 |
| FERC | Issue Scoping Document 2 (if necessary) | 11/23/21 | 5.10 |
| Licensees | File Proposed Study Plan | 11/23/21 | 5.11(a) |
| All Stakeholders | Proposed Study Plan Meeting | 12/23/21 | 5.11(e) |
| All Stakeholders | File Comments on Proposed Study Plan | 2/21/22 | 5.12 |
| Licensees | File Revised Study Plan | 3/23/22 | 5.13(a) |
| All Stakeholders | File Comments on Revised Study Plan | 4/7/22 | 5.13(b) |
| FERC | Issue Director's Study Plan Determination | 4/22/22 | 5.13(c) |
| Mandatory Conditioning Agencies | File Any Study Disputes | 5/12/22 | 5.14(a) |
| Dispute Panel | Select Third Dispute Resolution Panel Member | 5/27/22 | 5.14(d) |
| Dispute Panel | Convene Dispute Resolution Panel | 6/1/22 | 5.14(d)(3) |
| Licensees | File Comments on Study Disputes | 6/6/22 | 5.14(i) |

| Responsible Party | Pre-Filing Milestone | Date | FERC Regulation |
|---|---|---|---|
| Dispute Panel | Dispute Resolution Panel Technical Conference | 6/11/22 | 5.14(j) |
| Dispute Panel | Issue Dispute Resolution Panel Findings | 7/1/22 | 5.14(k) |
| FERC | Issue Director's Study Dispute Determination | 7/21/22 | 5.14(l) |
| Licensees | First Study Season | Spr/Sum 22 | 5.15(a) |
| Licensees | File Initial Study Report | 4/22/23 | 5.15(c)(1) |
| All Stakeholders | Initial Study Report Meeting | 5/7/23 | 5.15(c)(2) |
| Licensees | File Initial Study Report Meeting Summary | 5/22/23 | 5.15(c)(3) |
| All Stakeholders | File Disagreements/Requests to Amend Study Plan | 6/21/23 | 5.15(c)(4) |
| All Stakeholders | File Responses to Disagreements/ Amendment Requests | 7/21/23 | 5.15(c)(5) |
| FERC | Issue Director's Determination on Disagreements/Amendments | 8/20/23 | 5.15(c)(6) |
| Licensees | Second Study Season | Spr/Sum 23 | 5.15(a) |
| Licensees | File Updated Study Report | 4/21/24 | 5.15(f) |
| All Stakeholders | Updated Study Report Meeting | 5/6/24 | 5.15(f) |
| Licensees | File Updated Study Report Meeting Summary | 5/21/24 | 5.15(f) |
| All Stakeholders | File Disagreements/Requests to Amend Study Plan | 6/20/24 | 5.15(f) |
| All Stakeholders | File Responses to Disagreements/ Amendment Requests | 7/20/24 | 5.15(f) |
| FERC | Issue Director's Determination on Disagreements/Amendments | 8/19/24 | 5.15(f) |
| Licensees | File Preliminary Licensing Proposal (or Draft License Application) | 5/3/24 | 5.16(a)-(c) |
| All Stakeholders | File Comments on Preliminary Licensing Proposal (or Draft License Application) | 8/1/24 | 5.16(e) |
| Licensees | File Final License Application | 9/30/24 | 5.17 |

| Responsible Party | Pre-Filing Milestone | Date | FERC Regulation |
|---|---|---|---|
| Licensees | Issue Public Notice of Final License Application Filing | 10/14/24 | 5.17(d)(2) |

Brookfield
Renewable

November 22, 2021

***Via Electronic Filing***

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Proposed Study Plan**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), a subsidiary of Brookfield Renewable and Licensee of the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458) (collectively referred to as the "Projects"), herein files with the Federal Energy Regulatory Commission (FERC or Commission) the Proposed Study Plan (PSP) for the relicensing of the Projects. The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot Counties, Maine.

On June 11, 2021, GLHA filed the Notices of Intent and Pre-Application Document (PAD), which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through the Commission's Integrated Licensing Process (ILP). Subsequently, FERC issued Scoping Document 1 (SD1) on August 10, 2021 and held daytime and evening virtual scoping meetings on September 9, 2021.[1] Additionally, on the afternoon of September 9, 2021, GLHA hosted a virtual environmental site review.

Approximately 50 stakeholders filed letters with FERC providing general comments, comments regarding the PAD, comments regarding SD1, and/or study requests. Based on the stakeholder requested studies, GLHA is proposing the following studies:

1. Water Quality Study consisting of the following:
    a. Impoundment Trophic State Study (Ripogenus & Penobscot Mills Projects)
    b. Impoundment Aquatic Habitat Assessment (Ripogenus & Penobscot Mills Projects)
    c. Downstream Temperature and Dissolved Oxygen Study (Ripogenus & Penobscot Mills Projects)
    d. Riverine Aquatic Habitat Assessment (Ripogenus & Penobscot Mills Projects)
    e. Benthic Macroinvertebrate Assessment (Ripogenus & Penobscot Mills Projects)
2. Back Channel Instream Flow and Habitat Assessment Study (Penobscot Mills Project)

[1] As specified in SD1, the Commission did not conduct in-person public scoping meetings or in-person environmental site reviews due to concerns with COVID-19.

Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462
www.brookfieldrenewable.com
Tel: 207.723.4341
Fax: 207.723.3948

3. North Twin Impoundment Tributary Access Survey (Penobscot Mills Project)
4. Upstream Eel Passage Assessment Study (Penobscot Mills Project)
5. Desktop Downstream Eel Passage Assessment Study (Ripogenus & Penobscot Mills Projects)
6. Recreation Study (Ripogenus and Penobscot Mills Projects)
7. Historic Architectural Survey (Ripogenus & Penobscot Mills Projects)
8. Historic Operations Data and Assessment Study (Ripogenus & Penobscot Mills Projects)

As described in Section 4.0 of the PSP, GLHA intends to hold a virtual Proposed Study Plan Meeting on December 15-16, 2021 from 9:00 AM to 4:30 PM. **Stakeholders interested in participating in the PSP Meeting via webinar must RSVP to Cate Russell of HDR at cate.russell@hdrinc.com by December 10, 2021**. Prior to the meeting, GLHA will provide interested parties with a meeting invitation via email with the necessary webinar link.

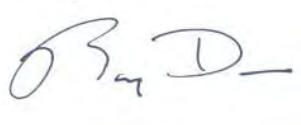
Pursuant to the schedule provided by FERC in SD1, comments on the PSP are due to FERC by February 21, 2022.

In comment letters received, stakeholders requested additional information be provided in the PSP. Where available, GLHA has compiled this information and included it in the PSP. However, additional information to address select requests require further research and will be provided in a supplemental filing (e.g., Revised Study Plan).

Concurrent with this filing, GLHA is providing a copy of this letter to all parties listed in the attached distribution list. Parties with interest in the upcoming relicensing can download an electronic copy of the PSP from FERC's eLibrary system at https://www.ferc.gov/docs-filing/elibrary.asp by conducting a search using the docket numbers p-2458 and/or p-2572.

If you have any questions regarding the PSP, please contact me by phone at (207) 775-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman
Licensing Manager
Brookfield Renewable

Enclosure: PSP for the Ripogenus and Penobscot Mills Hydroelectric Projects

cc: Distribution List

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

## Federal Agencies

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Stephanie Carman
Acting District Manager
Northeastern States
Bureau of Land Management
626 E. Wisconsin Avenue, Suite 200
Milwaukee, WI 53202-4617

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Kimberly Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Deborah Szaro
New England Region 1
Regional Administrator (Acting)
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Kenneth Hogan
North Atlantic-Appalachian Region Hydropower
Program Coordinator
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03301

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

## State Agencies

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation,
and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation,
and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation,
and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Kathy Howatt
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
101 Second Street
Hallowell, ME 04347

## Municipalities and Government Officials

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Dr. Annette Padilla, PhD
Interim Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
4 Gabriel Drive, Suite 3
Augusta, ME 04330

Jeffery Gifford
State Representative
346 Frost Street
Lincoln Center, ME 04457

Peggy Jo Stanley
State Representative
413 Turnpike Road
Medway, ME 04460

## Native American Tribes

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Marla Dana
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

John Banks
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

## Additional Parties

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Stephen Perry
Representative
Carpenters Health and Safety Fund

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Kelly Maloney
Manager
Great Lakes Hydro America LLC
150 Main Street
Lewiston, ME 04240

John Dicentes
President
International Association of Machinists
64 Congress Street
Millinocket, ME 04462-1312

Robert Farrington
International Brotherhood of Fireman
HCR 86, Box 195
Medway, ME 04460

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney &
Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Director
Maine Professional River Outfitters
PO Box 669
Millinocket, ME 04462-0669

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Bill Houston
Board of Directors
National Wildlife Federation

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Allison Economy
Representative for Allagash Gateway
Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Thomas Nannery
Sportsman's Alliance of Maine
RR 1 Box 1174
Augusta, ME 04330-9801

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Jeffrey Reardon
Maine Brook Trout Project Director
Trout Unlimited
267 Scribner Hill Road
Manchester, ME 04351

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Jeff Fayle
jfayle@gmail.com

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti
granby@cox.net

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris
nsharris@mgh.harvard.edu

Kathy Houston
58 Mystery Road
Kingfield, ME 04947

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Charles Paone
cpaonejr@gmail.com

Richard Parkes
Rparkesbb3@yahoo.com

Ed Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Robert Van Deventer
bobvnert@gmail.com

Wes Zemrak
2 Brookside Drive
Falmouth, ME 04105

Ms. Kimberly D. Bose
Secretary,
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426.

November 29, 2021

VIA Electronic Filing

**Reference: Scoping Document 2 for the Ripogenus Hydroelectric Project (P-2572-133) and Penobscot Mills Hydroelectric Project (P-2458-247)**

**RE; Scoping Document 2; Deficiencies: Lack of Hourly Flow, Lake Elevation and Power Generation for the Above Referenced Projects**

**For 25 plus years I worked for Great Northern Paper (GNP) and its successors. My field of responsibilities was the West Branch drainage from the Canadian border to the East Millinocket facility. My primary responsibility was collection and analysis of fisheries data and I co-authored the Ripogenus and Penobscot Mills Projects FERC License Application. Along with GNP's staff, I collected the fisheries information presented in the Licensee's various relicensing filings. As Project operations have changed, these 1980's data are no longer valid. I find the reliance on 35 year-old (pre peaking) data and the lack of quantifiable current fisheries and flow and elevation data very disturbing. The Licensee mentions "access to source material" in regard to current, useful information, this action has been impossible.**

**During all phases of this relicensing there have been numerous agency and stakeholder requests, directly or inferentially, for flow, lake elevation, and energy output from the facilities under consideration for a 30-year FERC license. While, by inference, FERC appears ready to consider these parameters, no current hourly tabular data have been presented in any filings. In formulating study and additional information requests, there are significant difficulties in judging impacts on fish, aquatic communities, recreation (boating and fishing) and aesthetics without hourly data for river flows, lake elevations and energy**

**production. These data should include at least 10 consecutive years ending in November 2021.**

**Presently Brookfield provides real-time McKay Station flow information (to the public) on a website called Safe Waters. There is no real-time flow for the five downriver facilities (North Twin, Millinocket, Dolby, East Millinocket, Medway) or archival information for any of the six generating facilities. Thus, there is no information on which to evaluate existing fishing opportunity, salmon and trout habitat, and littoral zone areas (smelt and plankton production). This makes identifying "data gaps" and commenting on proposed studies exceedingly difficult, if not impossible. This lack of project information is NOT what Scoping Document 1 suggests when it asks for input and comments.**

**Does FERC already to have the needed flow, lake level and perhaps energy production data? If so, FERC should make it widely available. These flow and elevation data are required as a monitoring condition in the WQC, Article 403 (2) and echoed similarly in the Appendix (Minimum Flows). These conditions are shown below, emphasis has been added;**

ARTICLE 403 (2)
"….the locations and ***methods to be used for recording data on minimum flows, and the plan for maintaining accurate records of these data*** **for inspection** and filing with the commission and resource agencies." (emphasis added)

APPENDIX Minimum Flows
"***The applicant shall continue to keep accurate flow records*** and monitor recreational use; shall review the effectiveness of its Water Use Plan with the commission,….". (emphasis added)

These data must exist and clearly FERC has easy access to the needed material. Average daily, weekly or monthly data either graphically or in summary form, are useless from a fisheries or aquatic communities prospective. For example, the licensee's September 30, 2021 submittal of the 1996 EIS lists figures D 7-9 of the Appendix are based on "averages". These figures (as well as summary tables) do not reflect instantaneous flow conditions e.g., peaks or valleys during critical feeding periods, predator avoidance, vertical or lateral salmonid movement, spawning activity, smelt drift, aquatic insect emergence/"hatches". These data are critical in evaluating angler use and success and the health of the fish and aquatic communities. Hourly tabular flow, elevation and energy production data has been

requested by the agencies and stakeholders and are desperately needed to make the licensing “process” work.

In the event FERC doesn’t have readily available access to the requested data, the licensee operates the reference projects remotely and through a computerized system. Archival data was used by the licensee to produce flow summary tables and figures used in the NOI and PAD. Thus, providing the needed hourly (average) flow, lake elevation and energy generation data will only require a phone call and a few “key strokes”.

Please make public flow, lake elevation and energy production data of the above referenced facilities available to the agencies and stakeholders in the requested hourly, tabular form.

Ed Spear

307 Mt Hope Ave.
Bangor, Maine 04401
Phone: (207) 217-4288
Email: edspear1@yahoo.com

Ms. Kimberly D. Bose
Secretary,
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426.

December 3, 2021

VIA Electronic Filing

**Reference: Ripogenus Project Hydroelectric Project(P-2572-133) and Penobscot Mills Hydroelectric Project (P-2458-247) The Licensee's Filing of November 22, 2021, Proposed Study Plan, Upstream Eel Passage Assessment**

**RE: Critical Missing Data, 1990's Millinocket Stream Eel Fishery.**

**The Licensee continues to claim that existing fisheries and aquatic communities information is adequate for FERC to issue new licenses for the above referenced projects. This is clearly not the case at Millinocket Stream, the outlet of Millinocket Lake, a storage impoundment of the Penobscot Mills Project (P-2458). In the case of Millinocket Stream, the license was either unaware or withheld "archival file information" on an eel fishery discussed below. This information could aid agencies, NGOs and FERC evaluate the Licensee's November 22, 2021 Eel Passage Assessments Study response to their (eel) study requests.**

**As required by WQC's Article 413, (brook trout stocking) GNP monitored Millinocket Stream angler use and success that resulted from annual stockings. These studies began in the late 1990s. I and other GNP staff members surveyed anglers three or four days a week from May though September. For several years there was an eel weir located just downstream of Stacyville Road Bridge. This bridge/weir location was a common "fishing site" as well as providing parking for anglers whom choose to move downriver. Anglers fishing this site were often recorded (on GNP creel survey forms) as (fishing at the) "bridge" or "eel weir". This parking area was also a place where the eel weir operator parked. The weir was operated by Rodney Corriveau (presently living in Millinocket, Maine) during parts of August, September and October (depending on flow). From conversation with the weir operator, eel outmigration occurred during certain moon phases and in conjunction with fall freshets resulting in high discharges from Millinocket Lake Dam. From conversations with Mr. Corriveau, annual catches reached two to three thousand pounds of eel. The licensee failed to include information on the 1990's intercept (weir) fishery of out-migrating (adult) eel in any of its voluminous filings e.g., The Licensee's PAD p 5-96. Section 3.2 of the Licensee's Proposed Study Plan states eel are present in "limited numbers". For the Millinocket Lake Impoundment and the downstream weir fishery, is not the case. Eel studies have been requested in four differing (upstream, downstream passage, etc.) agency filings. The licensee's failure to reference this fishery and provide "archival file" data or common public knowledge is disturbing. The history of this eel weir fishery needs to be provided to interested parties.**

Document Accession #: 20211206-5088 Filed Date: 12/06/2021

Ms. Kimberly D. Bose
Secretary,
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426.

December 6, 2021

VIA Electronic Filing

**Reference: Scoping Document 2 for the Ripogenus Hydroelectric Project (P-2572-133) and Penobscot Mills Hydroelectric Project (P-2458-247)**

**RE: Scoping Document 2; Deficiencies: Lack of Plan(S) to Identify Fish Populations and Angler Use in the Above Referenced Projects.**

**Throughout the scoping process including the licensee's responses, there been requests and rebuttals regarding the current status of fish (salmonid) and angler use and success at the above referenced projects. The licensee continues to make the unsubstantiated claim that the existing suite of pre-peaking archival (1980s) angler use and success and salmonid growth and condition information is an adequate base for insurance of a 30-year license. Scoping Document one and two have been strangely silent in their response and the "path forward" is unknown in regard to collection of angler and fisheries data.**

**Scoping Document II appears recognize that fish, salmon and trout, and angler use and success is a component of the NEPA process. FERC writes in section 2.3 titled *Issues Raised During Scoping***

"The marjority of comments identified concerns about project operations and potential project effects on water quality, didamdromous fish passsage, ***fish and wildlife resources and habitat, recreational oportunities*** ….." emhasis added

**However, FERC has failed to indicate how fisheries and aquatic communities data critical to NEPA process will be collected. The reader is left with the impression that FERC may accept the licensee's ridiculous assertion that 35-year pre-peaking fisheries and aquatic communities data for the Ripogenus Project and 30 year old pre-peaking fisheries and aquatic communities data for Penobscot Mills Project provide a sound base on which to issue a 30-year license(s). These data are desperately needed for riverine reaches. The** agencies and stakeholders need to know exactly how and when critical fisheries information including angler use data will be collected and FERC needs to clarify their intentions. If FERC is not intending to require the many times request fisheries (including angler surveys) and aquatic data, FERC has an obligation to state that and the reasons for refusal.

ED Spear

**307 Mt Hope Ave**
**Bangor, Me 04401**
**Email; edspear1@yahoo.com**
**Phone: 207-217-4288**

Brookfield
Renewable

December 8, 2021

*Via Electronic Filing*

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Proposed Study Plan Meeting Agenda**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), a subsidiary of Brookfield Renewable and Licensee of the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458) (collectively referred to as the "Projects"), herein files with the Federal Energy Regulatory Commission (FERC or Commission) the detailed agenda for the upcoming Proposed Study Plan Meeting scheduled to occur on December 15 and 16, 2021 for the Projects. The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot Counties, Maine.

On June 11, 2021, GLHA filed the Notices of Intent and Pre-Application Document, which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through the Commission's Integrated Licensing Process (ILP). Subsequently, FERC held daytime and evening virtual scoping meetings on September 9, 2021. Additionally, on the afternoon of September 9, 2021, GLHA hosted a virtual environmental site review.

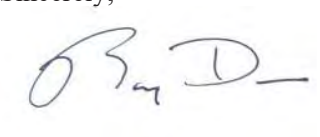
Pursuant to the ILP, on November 23, 2021, GLHA filed a Proposed Study Plan (PSP) with FERC. As described in Section 4.0 of the PSP, GLHA will hold a virtual PSP Meeting on December 15-16, 2021 from 9:00 AM to 4:30 PM, which will follow the enclosed agenda.

**Stakeholders interested in participating in the PSP Meeting via webinar must RSVP to Cate Russell of HDR at cate.russell@hdrinc.com by December 10, 2021**. Prior to the meeting, GLHA will provide interested parties with a meeting invitation via email with the necessary webinar link.

Concurrent with this filing, GLHA is providing a copy of this letter to all parties listed in the attached distribution list. Parties with interest in the relicensing can download an electronic copy of the PSP from FERC's eLibrary system at https://www.ferc.gov/docs-filing/elibrary.asp by conducting a search using the docket numbers p-2458 and/or p-2572.

If you have any questions regarding the enclosed PSP Meeting agenda, please contact me by phone at (207) 775-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman
Licensing Manager
Brookfield Renewable

Enclosure: PSP Meeting Agenda

cc: Distribution List

**Great Lakes Hydro America, LLC**
**Ripogenus Hydroelectric Project (FERC No. 2572)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458)**
**Proposed Study Plan Meeting Agenda**
**December 15 & 16, 2021**

****This is a running agenda, therefore times are estimated.****

| Estimated Time** | Topic |
|---|---|
| **December 15** | |
| 9:00-9:15 | Welcome, Housekeeping, Introductions, Relicensing Schedule |
| 9:15-9:30 | Project Overview |
| 9:30-9:45 | Additional Information Requests |
| 9:45-9:50 | FERC Study Criteria |
| 9:50-10:00 | Overview of Study Requests |
| 10:00-10:15 | Proposed Historic Operations Data and Assessment Study |
| 10:15-10:30 | Proposed Historical Architectural Survey |
| 10:30-11:30 | Proposed Recreation Study |
| 11:30-12:00 | Requested Controlled Flow Whitewater Boating and Access Study |
| 12:00-12:15 | Requested Aesthetic Resources Study |
| 12:15-12:30 | Requested Socioeconomics Study |
| 12:30-1:00 | 30-minute lunch break |
| 1:00-3:30 | Proposed Water Quality Study |
| **December 16** | |
| 9:00-9:15 | Welcome, Housekeeping, Introductions, Relicensing Schedule |
| 9:15-9:30 | Project Overview |
| 9:30-9:45 | Additional Information Requests |
| 9:45-9:50 | FERC Study Criteria |
| 9:50-10:00 | Overview of Study Requests |
| 10:00-10:30 | Proposed Back Channel Instream Flow and Habitat Assessment Study |
| 10:30-11:00 | Proposed North Twin Impoundment Tributary Access Survey |
| 11:00-11:30 | Proposed Upstream Eel Passage Assessment Study |
| 11:30-12:00 | Proposed Desktop Downstream Eel Passage Assessment Study |
| 12:00-12:15 | Requested 3D Computational Fluid Dynamics Modeling Upstream and Downstream of the Discharge and in Vicinity of Powerhouse Forebays |
| 12:15-12:30 | Requested Evaluation of American Eel Size and Timing of Downstream Migratory Movements |
| 12:30-1:00 | 30-minute lunch break |
| 1:00-1:15 | Requested Downstream American Eel Passage Alternatives Study |
| 1:15-1:30 | Requested Upstream Fish Passage Alternatives Study |
| | Requested Downstream Fish Passage Alternatives Study |
| 1:30-1:45 | Requested Study to Evaluate the Effects of Operating the Penobscot Mills and Ripogenus Dams on the Hydrology of the West Branch and Mainstem Penobscot River Using an Indicators of Hydrologic Alteration Model |
| | Requested Study to Evaluate Project Effects on River Temperature in West Branch and Mainstem Penobscot River |
| | Requested Study to Evaluate Future Flow and Water Temperature Scenarios |
| 1:45-2:00 | Requested Fish Assemblage Study |
| 2:00-2:15 | Requested Freshwater Mussel Survey |
| 2:15-2:30 | Requested Ripogenus Flow Excursion Study |
| 2:30-2:45 | Requested Terrestrial, Wildlife, and Botanical Resources Study |
| 2:45-3:00 | Requested Northern Long-eared Bat Acoustic Survey |
| 3:00-3:15 | Requested Study to Assess Presence of Wood Turtles and Project Effects on Nesting Habitat, Nesting Success, and Overwintering Habitat |
| 3:15-3:30 | Requested Marsh Bird Surveys |
| 3:30-3:45 | Requested Furbearer Surveys |
| 3:45-4:00 | Requested Common Loon Productivity Assessment |
| 4:00-4:15 | Requested Common Loon Management Plan Assessment |
| 4:15-4:30 | Next Steps |

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

## Federal Agencies

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Stephanie Carman
Acting District Manager
Northeastern States
Bureau of Land Management
626 E. Wisconsin Avenue, Suite 200
Milwaukee, WI 53202-4617

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Kimberly Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Deborah Szaro
New England Region 1
Regional Administrator (Acting)
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Kenneth Hogan
North Atlantic-Appalachian Region Hydropower
Program Coordinator
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03301

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

## State Agencies

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation,
and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation,
and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation,
and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Kathy Howatt
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
101 Second Street
Hallowell, ME 04347

## Municipalities and Government Officials

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Dr. Annette Padilla, PhD
Interim Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
4 Gabriel Drive, Suite 3
Augusta, ME 04330

Jeffery Gifford
State Representative
346 Frost Street
Lincoln Center, ME 04457

Peggy Jo Stanley
State Representative
413 Turnpike Road
Medway, ME 04460

## Native American Tribes

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Marla Dana
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

John Banks
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

## Additional Parties

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Stephen Perry
Representative
Carpenters Health and Safety Fund

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Kelly Maloney
Manager
Great Lakes Hydro America LLC
150 Main Street
Lewiston, ME 04240

John Dicentes
President
International Association of Machinists
64 Congress Street
Millinocket, ME 04462-1312

Robert Farrington
International Brotherhood of Fireman
HCR 86, Box 195
Medway, ME 04460

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney &
Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Director
Maine Professional River Outfitters
PO Box 669
Millinocket, ME 04462-0669

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Bill Houston
Board of Directors
National Wildlife Federation

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Allison Economy
Representative for Allagash Gateway
Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

Thomas Nannery
Sportsman's Alliance of Maine
RR 1 Box 1174
Augusta, ME 04330-9801

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Jeffrey Reardon
Maine Brook Trout Project Director
Trout Unlimited
267 Scribner Hill Road
Manchester, ME 04351

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Jeff Fayle
jfayle@gmail.com

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti
granby@cox.net

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris
nsharris@mgh.harvard.edu

Kathy Houston
58 Mystery Road
Kingfield, ME 04947

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Charles Paone
cpaonejr@gmail.com

Richard Parkes
Rparkesbb3@yahoo.com

Ed Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Robert Van Deventer
bobvnert@gmail.com

Wes Zemrak
2 Brookside Drive
Falmouth, ME 04105

Charles P Paone, JR, WINDHAM, NH.
There has been much discussion on collecting new data to assess the existing water Management plan and the impacts it has had on water quality, the environment, and the recreational use of natural resources. However, there has been little discussion of the need to monitor the future impacts of climate change on the critical assumptions that would be used to to develop a new water management plan and or manage the water resources during a new license period which could be as long as 50 years.
One of the most critical assumptions of the water Management plan is the estimated inflows to the impoundment. The water inflows to the impoundment are a direct consequence of the climactic conditions such as snowfall, time duration of the snow melt, and obviously rainfall. Yet, it is these very conditions that the global scientific community has recognized will be significantly affected by climate change.
The Commission has expressed its concern about using climate change models or assessment that would support, with any degree of accuracy and reliability, prediction of water availability at the individual project level.
The very fact that the Commission does not feel that there is adequate climate research and modeling that applies to this specific project area speaks to the need of having a dynamic water Management plan that continually monitors and assesses any future changes to the critical assumptions of the water Management plan and modifies those assumptions if the new data indicates the old assumptions are no longer relevant.
These future measurements should include:
- daily impoundment elevations
- daily outflows ( minimum, maximum, and average discharges)
This type of information was requested by FERC for a 10-year historical period. It is this type of information that needs to be monitored during the entire new license period for the reason stated above.

Additionally, the Ripogenus impoundment is comprised of multiple basins, each with their own characteristics. A study should be taken to determine the percent increase of littoral habitat exposure for each of the Ripogenus basins at various water elevations. It is clear from intervener comments that Caribou lake has been severely harmed by drastic increases in the acreage of the littoral habitat exposure, and I believe disproportionately as compared to the other lakes in the impoundment. This data could be used to develop a drawdown restriction as has been established in other Maine impoundments.
It is essential for all these reasons that the commission establish a dynamic water Management plan that allows for it to be adjusted to reflect changing climactic conditions. It would be reckless to do otherwise.

David Ahola, Veazie, ME.
I been fishing the West Branch of the Penobscot River for the past 20 years. The quality of fishing has continually declined over the past several years. There are few salmon in the reaches below the Big Eddy, and those there are both smaller and less healthy (skinny). Water levels rise in the morning and fall in the evening, making angling difficult. This has gotten to the point that I rarely make trips back up to one of my favorite fishing spots. FERC needs to correct the recent change in project operations back to historical constant base flow. Thank you for giving proper attention to this important matter. This is having a detrimental effect on the West Branch fishery and the local economy.
David Ahola, M.D.
Veazie, ME
04401

Brookfield
Renewable

December 21, 2021

***Via Electronic Filing***

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Copy of Proposed Study Plan Meeting Presentation**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), a subsidiary of Brookfield Renewable and Licensee of the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458), herein files with the Federal Energy Regulatory Commission a copy of the PowerPoint slides that were presented during the December 15 and 16, 2021 Proposed Study Plan Meeting.

If you have any questions regarding the enclosed presentation, please contact me by phone at (207) 775-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,

Randall Dorman
Licensing Manager
Brookfield Renewable

Enclosure: PSP Meeting Presentation

January 5, 2022

Ms. Kimberly D. Bose
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Via online submission to: http://www/ferc.gov (cross-filed)**

Subject: **Maine Council of Trout Unlimited Amplifying Report for Observed Low Flow Events for the Ripogenus Project (P-2572)**

Dear Secretary Bose:

On behalf of its six chapters and over 2,000 members, Maine Council of Trout Unlimited (TU) submits this report in amplification of the report of low flow events for the Ripogenus Project (P-2572) that TU filed on September 21, 2021.

**Background**

On August 30, 2021, an apparent flow excursion was witnessed below Ripogenus Dam by Chewonki Campground staff who informed TU of the event and provided photos. Such events have been occurring for the last ten years or more, but seem to be on the increase of late. The operator has generally reported them within ten days of their occurrence and we expected that to be case in this instance, but that did not occur. On September 13, TU called the FERC hotline and spoke with FERC official Mark Carter who explained that he would pass the information to appropriate FERC staff and that someone would be in contact with us. Hearing nothing back, we called again on September 15, and received the same assurance. On September 16, we were contacted by FERC official Alicia Burtner.[1] She explained how to report the event using FERC Online. Later that day, Chewonki Campground staff reported witnessing another low flow event. Rather than file a report of a separate event TU filed the report of the September 16 event with our report of the August 30 event.

To complicate matters, subsequent to the drafting of that report, Brookfield reported an excursion event that occurred on September 10, 2021.[2] It does not correlate with either of the flow events contained in our September 21, 2021 report. The Commission subsequently ruled that the September 10 flow event did constitute a license violation.[3]

Miles Puleio, who fishes and kayaks on the West Branch of the Penobscot River, participated in the proposed Study Plan Teleconference for the Ripogenus and Penobscot Mills project relicensings held on December 16, 2021.[4] Topics discussed included the study plan request submitted by TU for a Ripogenus

[1] Phone conversation, Stephen Heinz of TU and Alicia Burtner of FERC staff, September 16, 2021.

[2] Brookfield letter Subject: Ripogenus Project (FERC No. 2572); Whitewater Recreation Minimum Flow Excursion dated September 20, 2021, FERC Accession number 20210920-5168.

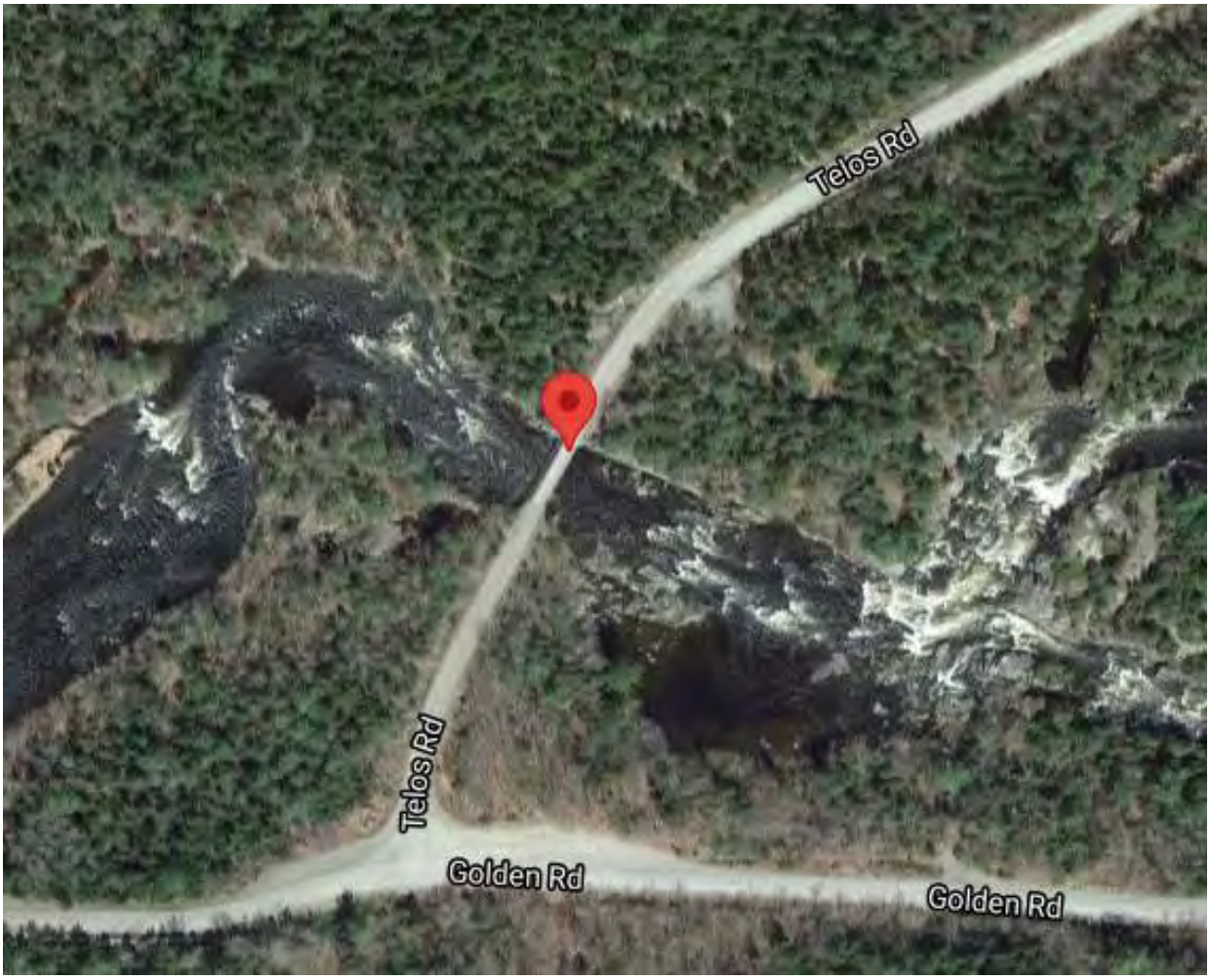
[3] FERC letter of November 8, 2021, Subject: Violation of Whitewater Recreation Flow – Article 402.
*"… at the Ripogenus Hydroelectric Project No. 2572, located on the West Branch Penobscot River in Piscataquis County, Maine. For reasons discussed below, we find you in violation of Article 402 of your project license."*

[4] Brookfield letter of December 8, 2021, Subject: Ripogenus Hydroelectric Project (FERC No. 2572-133) Penobscot Mills Hydroelectric Project (FERC No. 2458-247) Proposed Study Plan Meeting Agenda

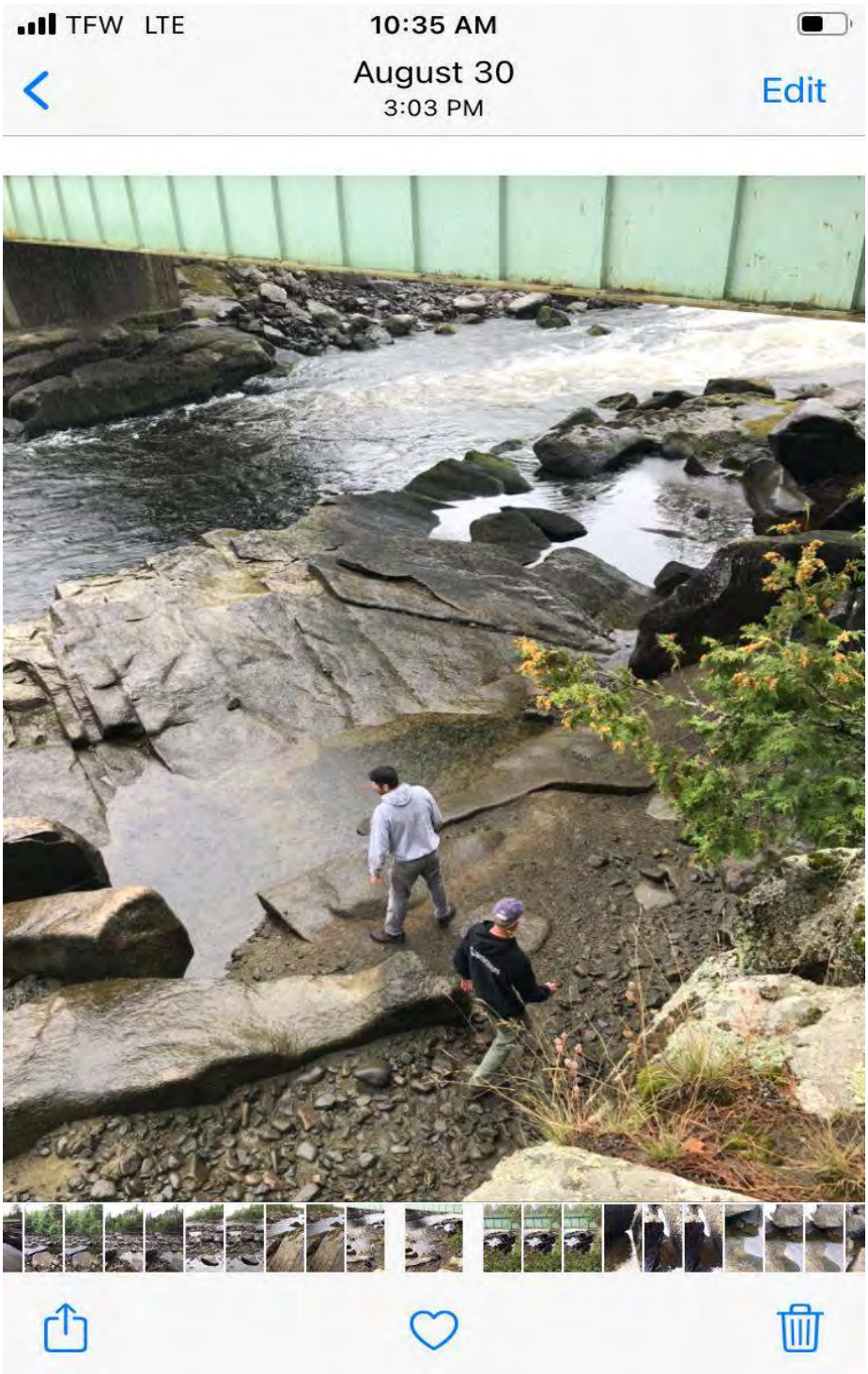
Flow Excursion Study that would conduct a planned low flow event with observers positioned downstream of McKay Station to see if strandings occurred. Miles contacted TU to say that he had a fish stranding photo taken during the August 30 event and macro-invertebrate stranding photos for the September 16 event. He also reported an additional low flow event that occurred on September 7, 2021 that we will address later in this document.

**Strandings Photos**

The photographs below were taken by Miles on the north bank of the West Branch of the Penobscot River immediately below Telos Bridge on August 30, 2021. He has verified that the date/time markings are correct. This map shows the exact location where the photos were taken:




The photo that follows on the next page was taken by Miles looking down at the river from the bank above and includes fellow kayakers Riley Adams and Bill Dallam.




Subsequent photos are of the pool to their immediate left. Please note that the place where they are pictured standing had been running at whitewater flows prior to the event that cause that reach to be classified as Class 5 whitewater. Rapid drops in water level have are likely to strand fish. Miles kayaked to check for other stranded fish and observed about 8 - 12 other stranded fish during this event with four fish specifically noted in a pool just above Holbrook. It is difficult to see stranded in pools, more difficult to photograph them.

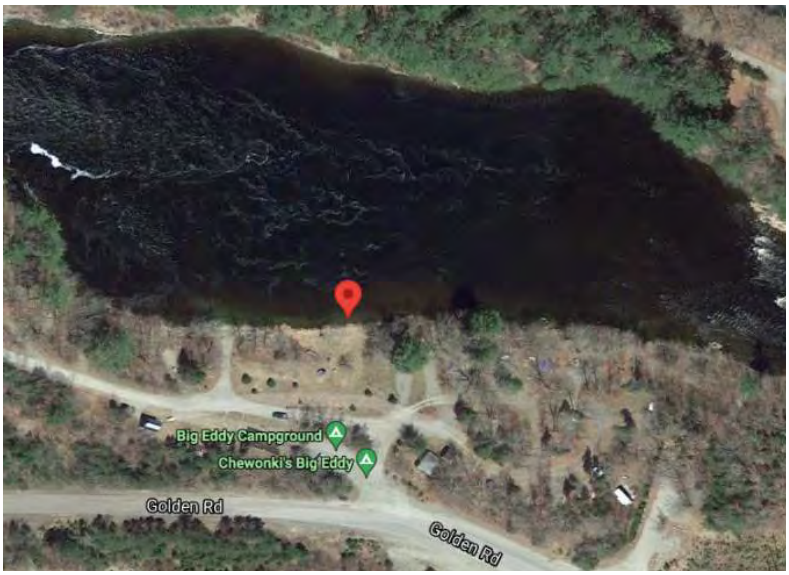
Here is a photo of the pool, it is difficult to see the stranded fish that it contains.



Here is the stranded fish. It is a landlocked salmon estimated at 12-13” in length. It was likely stranded in the pool for about three hours.



Here is are the map location and photos of a stranded macro-invertebrates taken during the September 16 event as video that may be viewed at https://drive.google.com/file/d/1KNQf-OzvoG2Lcrq_F2rdDitD3JyHB2I5/view?usp=sharing Numerous other stranded macro-invertebrates were also observed in the vicinity of the campground.









**Additional Low Flow Event**

Miles also reports that a previously unreported low flow event occurred on September 7. This flow was lower than evening flows had been and is estimated to be 800 cfs or less. This occurred at about 6:30 p.m. and persisted for about an hour. The photo that follows the map was taken looking downstream from where Holbrook joins the West Branch on the south bank. The location where the photo was taken is depicted on this map:






The following summary of incidents is provided for clarity:

- August 30 - reported by Maine TU Council filing dated September 21, 2021
- September 7 - previously unreported event (photo immediately above)
- September 10 - reported by Brookfield, ruled a license violation by FERC
- September 16 - reported by Maine TU Council filing dated September 21, 2021

**Ongoing FERC Action**

The photos provided afford additional verification of the August 30 and September 16 events and documents both fish and macro-invertebrate strandings. FERC established a sub-docket for these incidents: P-2572-134. It is assumed that the Commission is continuing to investigate the low flow events of August 30 and September 16, 2021; we assume that the information contained in FERC's filing of December 29, 2021 (bold supplied) will be considered when it rules whether these events constitute license violations as well:

"*Docket(s): P-2572-000*
*Filing Type: Part 12 Consultant Safety Inspection Reports*
*Description: Brookfield Renewable submits 11th Part 12D Independent Consultant's Safety Inspection Report and associated* ***Potential Failure Mode Analysis Addendum for the Ripogenus Project*** *under P-2572. "*

This casts doubt into our minds as to if the corrective actions Brookfield took in 2015[5] to prevent flows below 400 cfs that we noted in our initial report were fully effective.

**Additional Considerations**

FERC Project Officer commented during the PSP teleconference previously referenced that TU's proposed Ripogenus Flow Excursion Study should not be conducted until it the frequency of such events were determined. Apparently, there were at least four events that occurred in a three-week period during August and September of 2021. This amplifying report documents that strandings did occur incident to the August 30, 2021 event and September 16, 2021 event. This report confirms that low flows associated with generator shut downs cause stranding events lasting for over an hour at the least due to travel time for maintenance crews from Millinocket to McKay Station, and were of a longer duration in these specific incidences. We hope that the operator will take the consequences of these events to aquatic organisms into consideration and include the requested Ripogenus Flow Excursion Study in its Revised Study Plan. While these events are not of the magnitude of dewatering of the Upper Madison River in Montana due to a dam gate malfunction,[6] these events have been occurring for some time and studies to determine the magnitude of their impacts below Ripogenus Dam are long overdue.

**Conclusions and Request**

Maine TU Council appreciates the Commission's continuing attention to the low flow events below Ripogenus Dam.

We request a copy of the Brookfield Renewable 11th Part 12D Independent Consultant's Safety Inspection Report and associated Potential Failure Mode Analysis Addendum for the Ripogenus Project under P-2572, Accession Number 20211229-5198, especially the addendum.

We believe that this filing bears on the study requests for the relicensing of the Ripogenus Project and have cross-filed this letter to docket P-2572-133.

[5] Brookfield letter dated January 7, 2016, RE: Ripogenus Project 2572, Article 402 Compliance; Follow-up to June 13, 2015 Flow Excursion due to McKay Station Outage

[6] Montana Free Press, Dam malfunction leaves upper Madison River trout high and dry, August 1, 2021. Accessed at - https://montanafreepress.org/2021/12/01/dam-malfunction-halves-madison-river-flow/

Sincerely and respectfully,



Stephen G. Heinz
Maine TU Council FERC Coordinator

Additional distribution:

FERC Docket P-2572-133
E-mail Courtesy Copies: Mark Carter, Sarah Sindo, Alicia Burtner, Miles Puleio, Ed Spear

Kimberly D. Bose January 7, 2022
Secretary
Federal Energy Regulatory Commission
888 First Street,
NE Washington, DC 20426

Re: Fisheries Studies, Penobscot Mills Hydroelectric Project (FERC No. 2458)

Comments on Great Lakes Hydro America's December 21, 2021 Filing, *a copy of the Proposed Study Plan Meeting Presentation for the Ripogenus and Penobscot Mills Hydroelectric Projects under P-2572, et. al.*

Dear Secretary Bose, Via FERC E-filing

Following the December 15-16 Proposed Study Plan (PSP) virtual meeting, Great Lakes Hydro America (the Licensee) reposted its study Plans. Despite extended questions and answers, there were no noticeable changes. This is disappointing. The PSP is silent on the cold water salmonid specie(S) to be evaluated in studies of the by-passed historic West Branch of the Penobscot River Channel (WB channel). In prior filings Brook trout (trout) were suggested as the cold water study species. Discussions during the December 16 meeting focused on trout but included landlocked salmon (salmon), the only "cold water" species presently found in the tailwaters of the project facilities.

At this time the Licensee is proposing only two studies that directly bear on Penobscot Mills Project fisheries (and none for the WB below McKay Station!); salmon passage into possible North Twin Impoundment spawning tributaries and a flow study of the WB channel. Neither study meets the PSP criterion of identified "data gaps". I also find the choice of studies, methods and (fisheries) goals confusing. While I understand that we are early in the process, some clarity is needed. I left the December 16, 2021 online meeting with the impression that trout were the cold water species to be evaluated in WB channel flow studies. This would be a mistake.

The Preliminary Application Document (PAD) states "*GLHA maintains that a full suite of new studies is not needed, that the vast body of information on which*

*today's certifications and licenses are soundly based and should be relied upon for these relicensing's"*. Yet only two of the agency and stakeholder requested studies were "accepted" by the licensee and these are in areas where ample existing data exist. In both cases, proposed studies focus on physical factors e.g., gradient, substrate and in the case of the WB Channel, instream flow.

Salmonid access to North Twin Impoundment spawning tributaries was well documented in the 1992 application (Vol IX Appendices pp 57-61). Electrofishing of all possible tributaries' during the late 1980s identified only two salmon spawning areas and no potential impediments; Nahmakanta Stream and the WB as it flows into Ambajesus Lake. As there have been no major geographical upheavals e.g., earth quakes, rock slides, the stream beds have not changed. Fish passage remains a function of flow rather than lake level management. Adult salmon telemetry studies will however, provide useful behavior information, including spawning escapement and post spawning survival, and possible movement in the Joe-Mary watershed.

The proposed flow study of the WB channel is also redundant. There have been no major geological changes, the gravel, rock, and boulders remain as they were in 1987. Data sets collected in 1987 can be used as desired, along with the fish species desired to produce weighed usable area. The only change from the 1987 study is the licensee's proposal (not shown in the December 21, 2021 PSP's slide presentation) is to substitute brook trout (trout) as THE only cold water species to be evaluated. This obfuscatory request makes no fisheries sense and contradicts stated MeDIFW fisheries goals.

MeDIFW participated in the 1987-1988 flow study of the historical WB channel below Stone Dam. MeDIFW concurred with the choice of salmon as the evaluation species and participated in developing **adult Landlocked salmon** HSI curves. At that time existing water temperature regimes precluded trout from consideration, projected temperatures (from Quakish Lake) were considered too high and likely, even higher now given recent climate trends.

MeDIFW in its October 8, 2021 filing in support of trout as an WB channel evaluation species, reversed its 1987-1988 in goal of creating salmon habitat. *"fisheries goals and growing angler pressures in the region"* were cited as the reason. However, 2017-2018 Millinocket Lake winter survey data (November 11,

2021 filing) indicated that fishing pressure has actually declined. Each MeDIFW region has hundreds of ponds and miles of stream to oversee and they do an excellent job of managing the various resources. However, licensing is an evidentiary proceeding and subjective judgement is no substitute for empirical data. It would be helpful if MeDIFW provided annual creel survey estimates of angler use and success in local trout streams located in the massive Enfield Region. This would demonstrate an increase in brook and stream angling pressure and the demand for ten inch trout stocked in the spring or larger, 13 inch trout stocked in October.

Other factors demonstrate the folly of using trout, that other than spawning, require no flow (see attached HIS curves) in stream channels, as the only cold water evaluation species

- There are no nearby riverine trout fisheries for resident fish. In fact, trout are only rarely seen in central Maine rivers and when observed in the "summer", it always near cold water refugia.
- Outflow from Quakish lake is by surface discharge and late spring/summer temperatures greatly exceed those temperatures tolerated by trout.
- MeDIFW manages local riverine areas for salmon and trout have never been reported in creel surveys of waters below the North Twin, Millinocket or Dolby facilities.
- The licensee's May and Fall trout stocking of nearby Millinocket Stream where flows are designed for salmonid species have never produced a holdover trout (one stocked in the spring and recaptured in the fall or a trout stocked in the fall recaptured in the spring).

The same biotic considerations of 1988 remain in place today. These factors are;

- Riverine reaches above and below Stone Dam support fishable salmon populations. Thus, salmon in the WB channel would be expected to provide a similar fishery,
- The area below North Twin Dam has limited spawning and nursey area. Millinocket Stream has a surplus of spawning habitat and reproduction is

poor. Salmon are outlet spawners and under appropriate (split) flows, upstream (North Twin Dam) and downstream (Millinocket facility) mature fish would enter the watered WB Channel with suitable flow. Production of naturally spawned salmon would further support fisheries above and below the WB channel. Juvenile salmon are much more tolerant warm summer flows than any trout life stage.

- Shad Pond has depths similar to Nesowadnehunk Deadwater, which is the major overwintering area for the salmon population in the West Branch below McKay Station (FERC Project P2572). An increase in overwintering habitat would be a major enhancement to the Millinocket Facility tailwater salmon population.
- After ice-out, overwintering salmon could move easily upriver, Grand Falls is NOT a barrier. It is possible, fish passage e.g., Steep Pass, would be required to provide access for juvenile and perhaps adults returning over Stone Dam into Quakish Lake and the upstream WB.

Managing the WB Channel for salmon meets goals set forth in **both current (2002-2021 ) and the (draft)FISHERIES STRATEGIC PLAN 2021-2035. The PAD (5.4.1.1) states the current (salmon management);**

- **statewide management goals for landlocked salmon are to maintain the current distribution of principal fisheries for landlocked salmon, provide for a diversity of fishing opportunities, maintain and where possible expand the contribution of wild salmon to the population**

**The 2022 plan adds;**

**Maintain or enhance existing (salmon) populations *(High Priority)***

*"Identify potential strategies—including regulation, partnerships, habitat modification, ….."*

***Maintain healthy and sustainable landlocked Atlantic salmon fisheries***

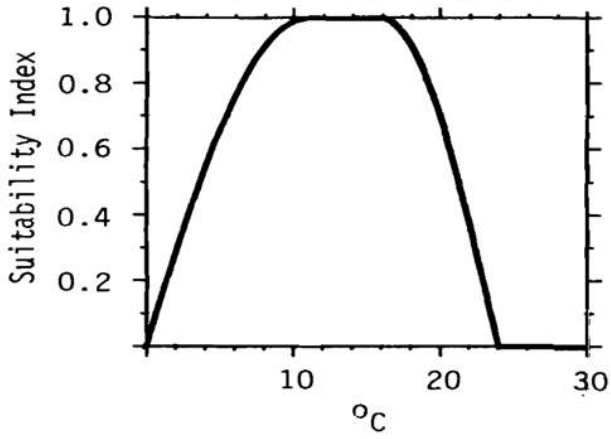
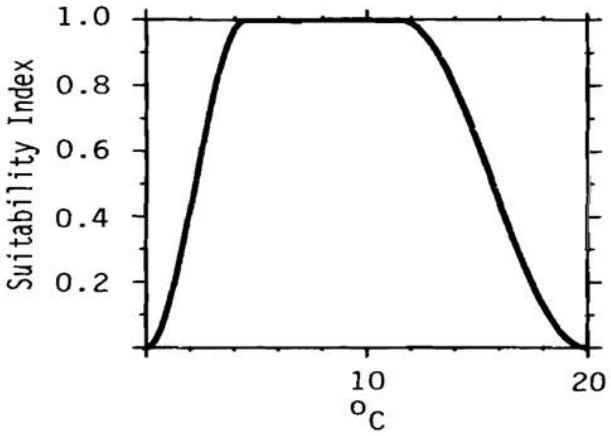
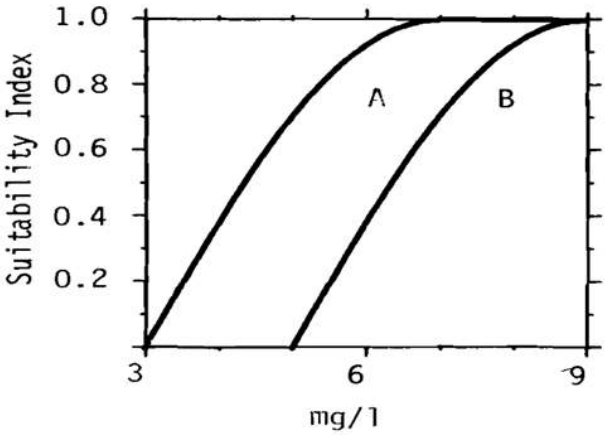
*"Advocating for in-watershed land and water management practices that maintain or enhance spawning and rearing habitats for wild populations, where populations are not overabundant*".

The 1996 EIS (section 4.8.2.3) cites a WB channel production of 245 salmon at a flow of 350 cfs and the FERC staff's estimate was probably conservative. Given the current "catch and release" ethic of todays' anglers, riverine salmon populations are constantly caught and released, recycled (e.g., Roach River, East Outlet of Moosehead Lake). Such a WB channel salmon population would produce a catch of 500-600 fish and would partially mitigate for reduced riverine salmon populations and lost fishing opportunity (as these areas are enclosed by imposing fences) below the Millinocket and Dolby facilities. The added benefit of naturally spawned and reared juvenile salmon increases the value derived from WB channel salmon management. Salmon management far out-weighs the indefensible idea of a possible stocked trout program. The proposal of a stocked trout program appears designed to produce low flow(s) in the WB channel rather than practical fisheries management goals that would require higher flows.

It should be clear to Agencies, stakeholders and FERC staff that management of the WB channel for either wild or stocked trout is an impractical fishery goal designed by the licensee to produce a low flow option. FERC should require that all life stages of salmon are included in the forthcoming WB channel flow study.

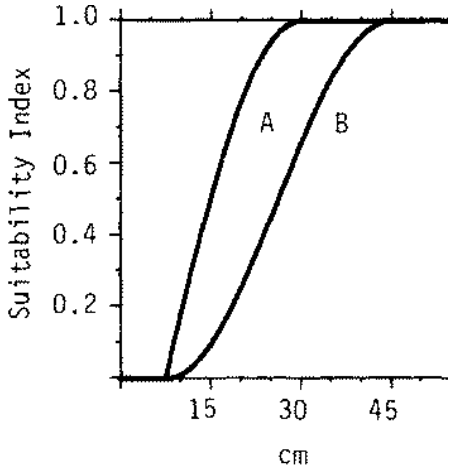
Contact information

Ed Spear
307 Mt Hope Ave
Bangor, Me 04401
Phone: 207-217-4288
Email edspear1@yahoo.com

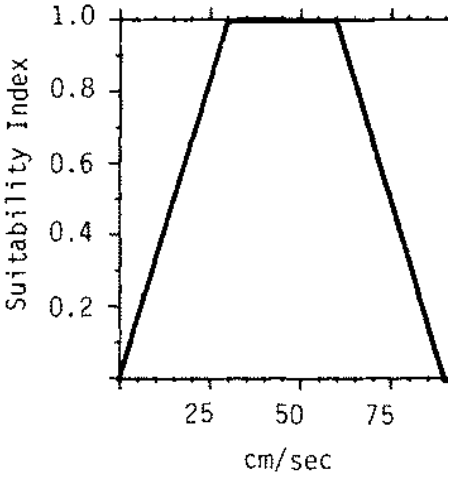
| Foot | Variable | | Suitability graph |
|---|---|---|---|
| ,L | $V_1$ | Average maximum water temperature (°C) during the warmest period of the year (adult, juvenile, and fry).<br><br>For lacustrine habitats, use temperature strata nearest optimum in dissolved oxygen zones of > 3 mg/l. |  |
| ٢ | $V_2$ | Average maximum water temperature (°C) during embryo development. |  |
| ,L | $V_3$ | Average minimum dissolved oxygen (mg/l) during the late growing season low water period and during embryo development (adult, juvenile, fry, and embryo).<br><br>For lacustrine habitats, use the dissolved oxygen readings in temperature zones nearest to optimum where dissolved oxygen is > 3 mg/l.<br><br>A = ≤ 15° C<br>B = > 15° C |  |

$V_4$ Average thalweg depth (cm) during the late growing season low water period.

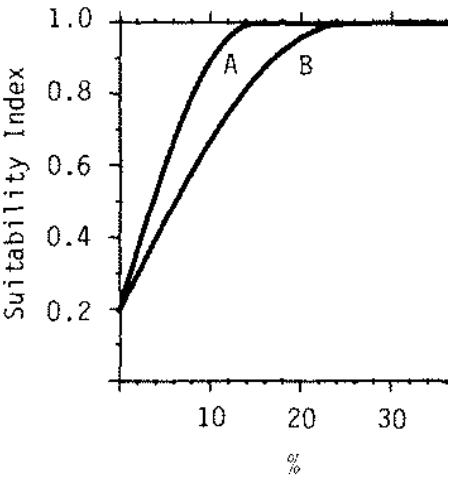
A = stream width ≤ 5 m
B = stream width > 5 m




$V_5$ Average velocity (cm/sec) over spawning areas during embryo development.




$V_6$ Percent instream cover during the late growing season low water period at depths ≥ 15 cm and velocities < 15 cm/sec.
A = Juveniles
B = Adults



Ms. Kimberly D. Bose January 27, 2022
Secretary,
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426.

VIA Electronic Filing

**Reference: Ripogenus Hydroelectric Project (P-2572-133)**

**RE:** A Study Request; The Need to Determine the Status of the Ripogenus Impoundment Zooplankton Population and its Relationship to Larval and Juvenile Rainbow Smelt (Osmerus mordax)

Operations of the Ripogenus Project have changed from the 1996 license conditions of relatively stable base flows and (following) rule curve (storage) guidelines. These flow and lake level changes have significantly altered the observable biotic communities, fish and macro invertrabrates as well as impacting guilds not readily visible e.g., planktonic. Little data exists, but the status of the Ripogenus Impoundment landlocked salmon (salmon) and rainbow smelt (smelt) populations is, as explained below, appalling. Information concerning planktonic communities of the Ripogenus Impoundment and West Branch of the Penobscot River below McKay Station (West Branch) is desperately needed. FERC staff, agencies and stakeholders require current data to make informed decisions.

The Maine Department of Inland Fisheries and Wildlife (DIFW) conducted surveys of the Ripogenus Impoundment landlocked salmon (salmon) fishery during 2018-2021. These salmon growth, food habitat and general abundance studies demonstrated a fishery in decline; adult salmon were fewer and in poor condition. DIFW cited the lack of young of the year (YOY)/Age I smelt as the problem. These small (2-5 inch) smelt are suitable in size as salmon prey. Age II and older smelt are generally too large to be useful prey items for adult salmon. Similar YOY smelt trends exist in the West Branch where salmon growth is well below 1980s levels and smelt are generally absent. To their credit DIFW responded to the depressed Ripogenus salmon fishery by increasing the harvest of sub adult and adult (>12 inches) salmon. The goal was to increase the Ripogenus YOY smelt population by reducing salmon predation, thus allowing the smelt population(s) to recover. This strategy has yet to prove successful. Peer

reviewed literature demonstrates that salmon predation on smelt is an unlikely cause of the continuous (10-15 years) lack of juvenile smelt.

There are NO current data on the growth and abundance of smelt, phytoplankton or zooplanktons population in the Ripogenus Impoundment. To date, attempts to reduce the Ripogenus salmon population have failed to rejuvenate the smelt forage base. DIFW has stated that angler effort is not at the level needed to reduce the adult salmon population. While angler harvest offer possibilities in rebuilding smelt populations, there are better alternatives. A review of journal articles demonstrates that lake level management is the likely cause of a depressed/altered zooplankton community that has resulted in a depleted juvenile smelt forage base over the last ten plus years. These reasons all involve the abundance and structure of zooplankton populations. The cause and effect of lake level management e.g., timing of drawdowns, depth, temperature and fluctuation/compression of the littoral zone, lack of connectivity (between basins) need to be explored.

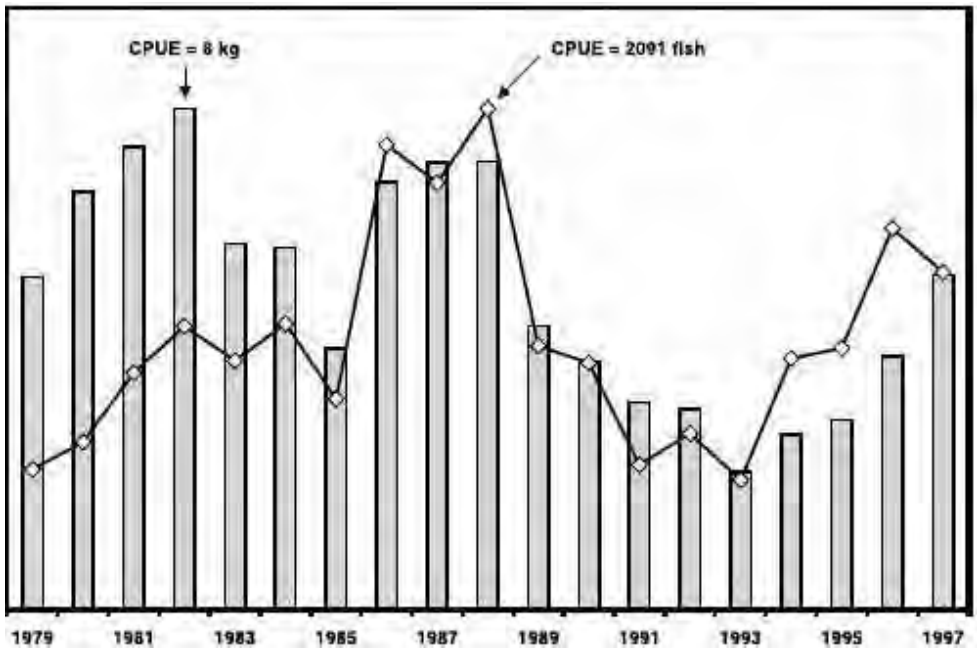
Smelt are vital forage species and in some areas also a hook and line or dip net fishery. Smelt are well distributed throughout the Northeast, Midwest (Kircheis and Stanley 1981) and Northwest where they exist as the sub species, *O. dentex*,. Because of their role as both a forage and table fish; smelt abundance, prey selection and habitat preference have been well studied. Without smelt as prey salmon populations collapse and cease to provide a fishery (Havey and Warner 1970).

A 1981 summary by Maine research biologists Fred Kircheis (MeDIFW) and Jon Stanley (UMO Coop Fish Unit) reviewed smelt populations in Maine and other Lakes throughout the Northeast. Regarding variability in smelt population abundance/densities, they concluded that *"such fluctuation are usual and do not appear related to predator abundance, rainbow smelt fishing or disease." Rainbow smelt larvae require small zooplankton such as rotifers when they begin feeding, "unavailability of suitable size plankton might limit survival of larvae" (McCullough and Stanley, 1979)."* (Kircheis and Stanley 1981). The literature provides insight into a litany of factors determining smelt abundance and growth.

Based on extensive review of the literature, the primary reason for a reduction in larval/juvenile smelt year class is cannibalism by age II and older smelt. Smelt are known to demonstrate alternate year class strength, often resulting from cannibalism as well as variable population densities resulting from predation or loss of suitable zooplankton as forage. Stetter et al. (2007) reported cannibalism

at between 38 and 95 percent of YOY year class strength. This cannibalism typically produces alternate smelt years classes where larval survival is poor the first year but strong the next year(s) (Lantry, B.F., and Stewart, D.J. 2000). He and Labar (1994) studying Lake Champlin smelt populations noted that gaps in year class strength could extend for three to five years. The figure below demonstrates smelt year class variability (Mills et al. 2003). These data are from the USA side of Lake Ontario.

**Fig. 6.** Indices of relative abundance (□) and biomass (bars) of age-1 and older rainbow smelt for a 21-year period, 1978 to 1998 caught in trawl tows of 10-min duration in late May – early June in U.S. waters of Lake Ontario. Indices are 3-year running means standardized to the maximum stratified CPUEs (catch-per-unit-effort) indicated. The X axis represent indices of abundance and biomass (0.0-1.2)




As there has been no change in the condition in West Branch salmon in ten plus years and DIFW has found a similar trend in Chesuncook, the lack of smelt has not been a cyclic event. Thus, both over-predation (by salmon) and cannibalism must be dismissed as factors in the ten to fifteen year decline of Ripogenus Impoundment smelt populations.

Depending on age, smelt have different temperature and depth preferences. Rooney, R.C and Paterson, M.J. (2009) provide excellent summaries of smelt life history requirements at life stage and depth. From these summaries we know that "*YOY smelt are eurythermal and are usually found along the shoreline in depths of 7-20 feet. Yearlings become pelagic and move to deeper cooler water at "middle depths in the pelagic zone" unless the epilimnion temperature exceeded 18°C, in which case they congregated just beneath the thermocline" (Appenzeller*

*and Leggett 1995). "Following fall turn over YOY smelt move to deeper water (Urban and Brandt 1993). Age II and older smelt can be found in the littoral zone in the spring but as surface waters warm, are usually distributed in the profundal zone with water temperature ranging for 6-14 C and depths greater than 15 meters." (Nellbring 1989)*. O'Gorman et al. (2000) reported that "smelt were forced into deeper water when Lake Ontario was colonized by exotic *Dreissena* mussels" and prey was reduced in shallower water.

Smelt are dependent on zooplankton and favor "large" bodied prey (including Diptera e.g., midge) and plankton communities can change with season and lake basin. Sheppard et al. (2012) described smelt food preferences in a Manitoba lake. "The Diet of freshwater population of rainbow smelt is generally composed of copepods and cladocerans (including Daphnia spp., Eubismina and Bossmina) (Urban and Brandt, 1993; Hrabik et al., 1998; Beisner et al., 2003; Johnson et al., 2004)". Selectivity of zooplankton prey varies with smelt age (and size). YOY Smelt (larval smelt >30 mm) are dependent on zooplankton and without suitable prey, populations collapse. Hrabik et al. (1998) described calanoid copepods as "favored prey". Age I and older smelt favor larger prey. Karnitz, J (1992) studying Lake Oahe Plankton found "Rainbow smelt prey were significantly larger than mean size of zooplankton in the environment" and that feeding increased with water temperature.

Zooplankton species composition can very between lake basins. Zooplankton communities in Lake George differed between two basins. "Large bodies zooplankton species were favored over smaller size species. Daphnia pulicaria that were dominant in one basin and were generally absent in the other basin where Mysis relicta was the dominate smelt prey item" (Siegfried, C. 1987). *Mysis* was most important in rainbow smelt diets in Western Lake Superior where smelt were again reported to choose larger taxa. Johnson et al (2004) reported a shift in species from prior studies of the Lake Superior zooplankton communities. Johnson, B.M., and Goettl, J.P. (1999) studying Horsetooth Reservoir smelt predation on zooplankton found "during 1989–1994 the abundant rainbow smelt population apparently reduced April and May crustacean zooplankton concentrations from historical levels of 40–80 organisms/L to less than 1.0 organism/L, and a switch occurred in the cladoceran species composition." In later years the smelt population declined and the zooplankton community rebounded. Other authors referenced declines in zooplankton abundance resulting from piscivorous predation. And while there were shifts in taxa, in all cases, zooplankton populations returned to prior levels.

The above paragraphs provide compelling evidence of the relation between the abundance, suitability and availability of zooplankton populations as prey as related to smelt abundance and survival. The collapse of the Ripogenus Projects zooplankton-smelt prey relationship has been long-term, perhaps fifteen years.

The exact mechanisms that created depressed zooplankton and Juvenile smelt declines in the Ripogenus Impoundment are unknown, but they are directly related to lake level management. Loss of shallow embayments (as hatchling habitat), compressed or shifting littoral zones reduce or eliminate critical larval or YOY smelt habitat, thus favoring older (and larger) age classes that prefer deeper water. These same factors apply to zooplankton communities that may have changed to meet altered intra species competition, food sources (phytoplankton) or micro habitat needs: depth, temperature, light (Appenzeller, A .and Leggett, W. 1995, Emery, A.R. 1973).

The status of the Ripogenus plankton population(s) needs to be defined. Zooplankton surveys need to be included in Ripogenus Impoundment water quality studies recommended by MeDEP. If used in conjunction with other water quality sampling events the collection costs are minimal. Fine mesh plankton nets can be “towed” behind the boat used in sampling Ripogenus Impoundment basins. The Caribou basin should be included in zooplankton sampling. Data collected in 2022 can then be compared to studies conducted in 1981 (see tables below; Vol VIII 1991 Rip Application). Locations, timing and methods of the 1981 Ripogenus Impoundment zooplankton surveys can be found in Volume VIII of the 1991 license application. To “fill in data gaps”, FERC needs to require similar studies as part of the MeDEP October 2021 Water Quality Study request.

Historically the Ripogenus Impoundment supported an excellent salmon fishery and the Impoundment’s smelt population was exported downstream (“drift”) through McKay Station where it created and then supported the “world class West Branch salmon fishery”. DIFW filings have demonstrated that these fisheries have collapsed. Echoing earlier works of Havey and Warner (1970), the DIFW 2012 management plan states, “Without adequate numbers of smelts, salmon growth and condition can become poor, markedly reducing their value as a sportfish” (Maine Salmon Management Plan. 2012). Without the export/drift of smelt, the West Branch fishery will disappear. FERC needs to ensure these two unique fisheries are returned to 1980s levels described by FERC staff in the 1996 EIS.

17-23 MAY 1981

| TAXA | RIPOGENUS LAKE (RIP1) SURFACE DENSITY* | RIP1 SURFACE % | RIP1 OBLIQUE DENSITY | RIP1 OBLIQUE % | RIPOGENUS LAKE (RIP1B) SURFACE DENSITY | RIP1B SURFACE % | RIP1B OBLIQUE DENSITY | RIP1B OBLIQUE % | BIG EDDY SURFACE DENSITY | BIG EDDY SURFACE % |
|---|---|---|---|---|---|---|---|---|---|---|
| ROTIFERA | 207141 | 42.3 | 350211 | 79.7 | 60583 | 40.5 | 181556 | 62.7 | 95170 | 78.1 |
| *Asplanchna* spp. | 694 | 0.1 | 669 | 0.2 | 48 | <0.1 | 252 | 0.1 | 83 | 0.1 |
| *Conochilus* spp. | | | | | | | | | | |
| *Filinia* spp. | | | | | | | | | | |
| *Kellicottia longispina* | 191903 | 39.1 | 333271 | 75.9 | 58274 | 39.0 | 171941 | 59.4 | 94359 | 77.5 |
| *Keratella* spp. | 233 | <0.1 | 1000 | 0.2 | 798 | 0.5 | 1407 | 0.5 | 56 | <0.1 |
| Soft-bodied Rotifers (small) | 14310 | 2.9 | 15049 | 3.4 | 1464 | 1.0 | 7807 | 2.7 | 672 | 0.6 |
| CLADOCERA | 152824 | 31.2 | 24840 | 5.7 | 40869 | 27.3 | 42074 | 14.5 | 6943 | 5.7 |
| *Bosmina* spp. | 19321 | 3.9 | 3285 | 0.7 | 22893 | 15.3 | 20111 | 6.9 | 1971 | 1.6 |
| *Camptocercus* spp. | | | | | | | | | | |
| *Ceriodaphnia* spp. | 17837 | 3.6 | 2512 | 0.6 | 2810 | 1.9 | 3511 | 1.2 | 719 | 0.6 |
| *Chydorus* spp. | | | | | | | | | | |
| *Daphnia longiremis* | 11568 | 2.4 | 3266 | 0.7 | 714 | 0.5 | 1674 | 0.6 | 508 | 0.4 |
| *Diaphanosoma leuchtenbergianum* | | | | | | | | | | |
| *Holopedium gibberum* | 103840 | 21.2 | 15704 | 3.6 | 14286 | 9.5 | 16556 | 5.7 | 3744 | 3.1 |
| *Leptodora kindtii* | 103 | <0.1 | | | 119 | 0.1 | 222 | 0.1 | | |
| COPEPODA | 130185 | 26.6 | 64090 | 14.6 | 48155 | 32.2 | 66044 | 22.8 | 19674 | 16.2 |
| Cyclopoids | 33910 | 6.9 | 15593 | 3.6 | 2190 | 1.5 | 3333 | 1.2 | 3087 | 2.5 |
| Copepods nauplii | 86239 | 17.6 | 46292 | 10.5 | 44560 | 29.8 | 60652 | 20.9 | 16024 | 13.2 |
| *Diaptomus pigmaeus* | 10036 | 2.0 | 2206 | 0.5 | 1405 | 0.9 | 2059 | 0.7 | 563 | 0.5 |
| *Epischura lacustris* | | | | | | | | | | |
| ALL ZOOPLANKTON TAXA | 490200 | 100.0 | 439141 | 100.0 | 149607 | 100.0 | 289674 | 100.0 | 121787 | 100.0 |

Blank spaces represent zero density or percent for individual taxa, i.e. species not present in sample.
*Density and percentage based on a mean of 3 replicate samples

TABLE 20. (continued)

13-19 SEPTEMBER 1981

| TAXA | RIPOGENUS LAKE (RIP1) SURFACE DENSITY* | RIP1 SURFACE % | RIP1 OBLIQUE DENSITY | RIP1 OBLIQUE % | RIPOGENUS LAKE (RIP1B) SURFACE DENSITY | RIP1B SURFACE % | RIP1B OBLIQUE DENSITY | RIP1B OBLIQUE % | BIG EDDY SURFACE DENSITY | BIG EDDY SURFACE % | DEBSCONEAG SURFACE DENSITY | DEBSCONEAG SURFACE % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ROTIFERA | 42928 | 18.0 | 77367 | 37.7 | 67381 | 18.7 | 70815 | 24.7 | 4038 | 26.4 | 480 | 42.3 |
| *Asplanchna* spp. | 1377 | 0.6 | | | 8095 | 2.2 | 5926 | 2.1 | 76 | 0.5 | | |
| *Conochilus* spp. | 5776 | 2.4 | 13886 | 6.8 | 25357 | 7.0 | 22518 | 7.9 | | | | |
| *Filinia* spp. | | | 242 | 0.1 | | | | | 974 | 6.4 | 387 | 34.1 |
| *Kellicottia longispina* | 10690 | 4.5 | 7522 | 3.7 | 16071 | 4.4 | 17148 | 6.0 | 38 | 0.3 | | |
| *Keratella* spp. | 485 | 0.2 | | | 357 | 0.1 | 370 | 0.1 | 2950 | 19.3 | 93 | 8.2 |
| Soft-bodied Rotifers (small) | 24600 | 10.3 | 55717 | 27.2 | 17500 | 4.8 | 24852 | 8.7 | | | | |
| CLADOCERA | 139986 | 58.6 | 100027 | 48.7 | 175714 | 48.6 | 120000 | 41.9 | 7362 | 48.1 | 302 | 26.6 |
| *Bosmina* spp. | 15156 | 6.3 | 17461 | 8.5 | 11667 | 3.2 | 10963 | 3.8 | 1922 | 12.6 | 106 | 9.4 |
| *Camptocercus* spp. | | | | | | | | | | | 38 | 3.4 |
| *Ceriodaphnia* spp. | 91588 | 38.3 | 64916 | 31.6 | 80833 | 22.4 | 69556 | 24.3 | 4279 | 28.0 | 55 | 4.8 |
| *Chydorus* spp. | | | | | 1786 | 0.5 | 1000 | 0.3 | 37 | 0.2 | 69 | 6.1 |
| *Daphnia longiremis* | 20225 | 8.5 | 8296 | 4.0 | 61667 | 17.1 | 19407 | 6.8 | 1050 | 6.9 | 34 | 3.0 |
| *Diaphanosoma leuchtenbergianum* | 12346 | 5.2 | 8330 | 4.1 | 17738 | 4.9 | 17407 | 6.1 | 74 | 0.5 | | |
| *Holopedium gibberum* | 670 | 0.3 | 485 | 0.2 | 2024 | 0.6 | 1333 | 0.5 | | | | |
| *Leptodora kindtii* | | | 539 | 0.3 | | | 333 | 0.1 | | | | |
| COPEPODA | 56158 | 23.5 | 27791 | 13.5 | 118095 | 32.7 | 95444 | 33.3 | 3860 | 25.2 | 306 | 27.0 |
| Cyclopoids | 20183 | 8.4 | 17125 | 8.3 | 48333 | 13.4 | 43000 | 15.0 | 2142 | 14.0 | 202 | 17.8 |
| Copepods nauplii | 9299 | 3.9 | 6660 | 3.2 | 11548 | 3.2 | 18148 | 6.3 | 407 | 2.7 | 46 | 4.1 |
| *Diaptomus pigmaeus* | 26676 | 11.2 | 4007 | 2.0 | 58314 | 16.1 | 34296 | 12.0 | 1310 | 8.6 | 57 | 5.0 |
| *Epischura lacustris* | | | | | | | | | | | 13 | 1.2 |
| TARDIGRADA | | | | | | | | | 37 | 0.2 | 34 | 2.9 |
| OTHER | | | | | | | | | | | | |
| ALL ZOOPLANKTON TAXA | 239072 | 100.0 | 205185 | 100.0 | 361190 | 100.0 | 286259 | 100.0 | 15298 | 100.0 | 1135 | 100.0 |

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Ed Spear
307 Mt Hope Ave.
Bangor, Me 04401
Email: edspear1@yahoo.com
Phone: 207-217-4288

Katie Stopera, Watertown, MA.
Save the fish!!!

Bring our lake levels back

Peter Stopera, Hollis, NH.
I’ve spend the past 40+ years on Caribou Lake (long green camp) fishing every year. The zooplankton can not survive, this management of the lake is killing a beautiful piece of America, which will be forever lost.

Fishing has been lousy for past several years, I kept on thinking I’m doing something wrong. Hopefully we can get our lake level back

My wife and are older now and spend about 1 month of the year at the lake, there is no running water. We need to use lake water to do our dishes (we have a Grey Water system). This past years and several years before we are literally walking 1000 feet across rocks, just to get 2 buckets of water.

Navigating on Caribou lake is now treacherous. In 2021, we could not get to Chesuncook lake from Caribou lake.

Terry Stopera, Hollis, NH.
Save the fish!! Save the loons!!

I’ve been going to Caribou Lake for almost 50 years and have never witnessed back to back years with the lake so deathly low. This can be changed.

Please help preserve the environment, bring back our lake levels.

MAINE HISTORIC PRESERVATION COMMISSION
55 CAPITOL STREET
65 STATE HOUSE STATION
AUGUSTA, MAINE 04333

JANET T. MILLS
GOVERNOR

KIRK F. MOHNEY
DIRECTOR

ORIGINAL

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SECRETARY OF THE
COMMISSION

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FEDERAL ENERGY
REGULATORY COMMISSION

February 2, 2022

Secretary Kimberly D. Bose
Federal Energy Regulatory Commission
888 First Street NE
Room 1A
Washington DC 20426

Project: MHPC# 1049-21 — FERC 2572-133 Ripogenus Hydro; FERC 2458-257 Penobscot Mills Hydro
Scoping Document

Town: Various, ME

Dear Secretary Bose:

I am writing to provide some clarification to our August 30, 2021 letter regarding the scoping document for the Ripogenus Hydroelectric Project (P-2572-133) and Penobscot Mills Hydroelectric Project (P-2458-247)" which was received in our office on August 19, 2021.

Archaeological survey is currently being undertaken for this project. However, the scope document does not adequately address cultural resources including archaeological sites around the impoundment margin and any architectural resources within the impoundment area.

Our office stands by our June 29, 2021 recommendations for architectural and archaeological surveys (see attachment).

Please contact Megan Rideout at (207) 287-2992 or megan.m.rideout@maine.gov if we can be of further assistance in this matter.

Sincerely,

Kirk F. Mohney
State Historic Preservation Officer

PHONE: (207) 287-2132 FAX: (207) 287-2335

February 10, 2022

Ms. Kimberly D. Bose
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Via online submission to: http://www/ferc.gov (cross-filed)**

Subject: **Preliminary Comments on the Proposed Study Plan (PSP) for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458)**

Dear Secretary Bose:

The Maine Council of Trout Unlimited ("TU"), Appalachian Mountain Club ("AMC"), American Whitewater ("AW"), Caribou, Chesuncook Lake Camp Owners Association, Chesuncook Dam Camp Owners Association, the Allagash Gateway Campground, and Andre Emerson Cushing Corporation file these comments to address our underlying concerns regarding the current status and direction of the relicensings of the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) being undertaken by Great Lakes Hydro America, LLC for Brookfield Renewable ("Brookfield") or ("Applicant"). Brookfield filed its Proposed Study Plan on November 22, 2021. While each of our organizations intends to file separate comments in response to specific study requests, we are providing these comments to voice our shared concerns regarding the manner in which Brookfield has approached the relicensing process to date.

**Background**

Maine Council of Trout Unlimited represents six local chapters with over 2,000 fisher-conservationists in Maine. The mission of the organization is to bring together diverse interests to care for and recover rivers and streams so our children can experience the joy of wild and native trout and salmon. The entire watershed of the West Branch of the Penobscot is especially important to a great many of our members who enjoy its fishing resources, including the area from McKay Station to Nesowadnehunk Falls, Ripogenus-Chesuncook-Caribou Lake, and the waters below to its confluence with the main stem of the Penobscot River that are greatly affected by the Ripogenus and Penobscot Mills projects.

Since 1876, the Appalachian Mountain Club has promoted the protection, enjoyment, and understanding of the mountains, forests, waters, and trails of the Appalachian region. AMC is the largest conservation and recreation organization in the Northeast with more than 90,000 members, supporters, and advocates, many of whom visit the lands and waters upstream and downstream of the projects for recreation.

American Whitewater is a national non-profit 501(c)(3) river conservation and recreation organization founded in 1954. With approximately 6,000 members and 100 affiliate clubs, representing tens of thousands of whitewater paddlers across the nation, American Whitewater's mission is to protect and restore our nation's whitewater resources and to enhance opportunities to enjoy them safely. Our members are primarily conservation-oriented kayakers and canoeists, many of whom live and/or engage in recreational boating in the New England region within reasonable proximity to the West Branch of the

Penobscot River. American Whitewater has long been involved with the FERC licensed hydropower projects in Maine, including hydropower projects located on the Penobscot, Kennebec, Rapid, and Magalloway rivers, and is party to settlement agreements that provide for whitewater boating opportunities that partially mitigate for project impacts. We highly value the whitewater activities offered by the West Branch.

The Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association represent the interests of those with property on the shores of these lakes who have been greatly affected by the severe dewatering of the Ripogenus-Chesuncook impoundment in recent years.

Allagash Gateway is a four-season sporting camp located on Ripogenus Lake near the Chesuncook Dam Point Boat Launch. It offers a private boat launch, canoeing, campsites, lodging, guide services, and a small store. During the summer months, Allagash Gateway's clientele is primarily interested in boating and fishing the lakes that make up the Ripogenus impoundment. Operations of the campground have been profoundly impacted over the last few years by the water levels of Ripogenus Lake and Chesuncook Lake.

Andre Emerson Cushing Corporation is the majority landowner in T3 R12 WELS. Approximately 80% of Ripogenus Lake and 20% of Chesuncook Lake are within the boundaries of T3 R12 WELS. William Cushing, a director of Andre Emerson Cushing Corporation, is a year-round resident of T3 R12 WELS, and his home is on Ripogenus Lake.

**The Problem**

Brookfield devotes pages of the Pre-application Document (PAD) to the assertion that: "*GLHA maintains that a full suite of new studies is not needed, that the vast body of information on which today's certifications and licenses are soundly based and should be relied upon for these relicensings. In addition, consistent with the Commission's criteria for study requests, the scope and extent of any new study be focused on addressing specific data gaps necessary to inform the development of license requirements."*[1] The PAD goes on to explain: "*These PM&E measures comprehensively address resource interests specific to the Project areas, as well as the larger river basin. These interests include water quality; management and balancing of flows within and downstream of the West Branch; aquatic and terrestrial resources; whitewater and recreational opportunities; cultural resources; and land management*."[2] The implication is that these measures remain fully adequate when they are not. The PSP states: "*Based on the totality of studies conducted, settlement agreements reached, PM&E measures incorporated, and water quality certifications issued, FERC's 1996 licenses concluded that the Projects are best adapted to serve the public interest. GLHA maintains that nothing has significantly changed that would alter this conclusion."*[3]

These assertions could not be more wrong and started the relicensing off on the wrong foot. A glaring example: The Ripogenus-Chesuncook impoundment has not been fully watered in two years, and the boat launch provided as PM&E has been so far from the waterline for most of the summers so as to be practically unusable, as many photos have clearly shown. The public interest has vastly changed since the last relicensing. Agencies bent over backward to ensure the profitability of the mills in East

[1] Brookfield Notices of Intent and Pre-application Documents for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) dated June 11, 2021, page 1-11.

[2] Id., page 1-8.

[3] PSP, pages 11-12.

Millinocket, the major employer in the area, that were supplied by power the projects provided. If that were not the case, the Use Attainability Analysis (UAA) and the provisions of 38 M.R.S.A. § 464(9-A) would not have allowed so much leeway for project operations, e.g., no minimum drawdown for the Ripogenus-Chesuncook impoundment other than the lowest levels the physical characteristics of Ripogenus Dam allow. Other examples included the dewatered Ripogenus Gorge on the main stem of the West Branch below Ripogenus Dam and 4.5 miles of the main stem below Stone Dam. **It is highly unlikely that these examples would have been permitted under the last relicensings were it not for economic considerations that simply no longer exist.** With the mills closed and the electricity produced by the projects going to the grid and not dramatically affecting the economy of the region, the situation has changed greatly, and that change needs to be acknowledged for the relicensing process to proceed effectively under the ILP. Brookfield should acknowledge this fact or include the request for a socio-economics study submitted by the Penobscot Indian Nation[4] in its Revised Study Plan.

Brookfield is required to provide FERC with information in the PAD and PSP referencing either relevant and recent existing studies or proposing new studies that address a number of subject areas including: Fish and Aquatic Resources, Recreation and Land Use, Aesthetic Resources and Tribal Resources. Instead, Brookfield relies on dated, unavailable, or non-existent studies or directs stakeholders to search for the information themselves at other agencies or on the Internet. Examples: Fisheries Resources - including "*Species life stage composition*"[5] were provided by referencing data some of which is over 30 years old. During the PSP teleconference, Brookfield referred the requirement to the Maine Department of Inland Fisheries and Wildlife. It is not the Department's requirement to provide the information, it is the Applicant's obligation, and the data still has not been fully provided for all projects' reaches except by references to a number of studies of varying ages. Recreation and Land use was nearly ignored, and we fail to understand the relevance of Brookfield's reference to "*Existing shoreline management policies*"[6] for an impoundment that has not been fully watered for two years and where the waterline has generally been hundreds of feet from the boat launch it accesses. There are many recreational amenities not in the project area that are well known and frequently used that will not be considered by forthcoming studies. The accepted information and study standards are simply being ignored.

The key studies are the flow studies proposed by the National Marine Fisheries Service (NMFS); key information is the ten years of operational data requested by the National Marine Fisheries Service (NMFS) There is no USGS flow gauge above the Medway Project nearby to the confluence of the West Branch with the main stem of the Penobscot River. Brookfield has been reluctant to release operational data that would reveal flows. Brookfield clearly has this data and has provided it to FERC Compliance Division on a number of occasions when reporting flow excursions. There was some discussion during the PSP Teleconference of delaying the requirement for a project operations and flow monitoring plan until after the new license is issued. This would make the relicensing process itself nearly meaningless. Over 50 years have passed since the passage of the Clean Water Act. Our nation's waters now run clean but too many still lack the indigenous aquatic organisms due to dams and lack of access to critical habitat. The dams on the West Branch will remain for the foreseeable future. The task of relicensing is to manage the resource most effectively to support all uses including power generation, ecology, recreation and aesthetics. Flow data is essential to the relicensings of both projects. It has been available all along and should have been offered with the PAD. While Brookfield has stated that it will provide

[4] Penobscot Nation letter dated October 12, 2021, RE: Penobscot Mills (P-2458-247) and Ripogenus (P- 2572-133) Notice of Intent, Pre-application document, Scoping document #1 and study requests

[5] Id., page 5.

[6] Id., page 6.

some flow data with the RSP, this will not provide stakeholders with sufficient time to analyze and comment on data that Brookfield has yet to provide.

The Integrated Licensing Process is intended to "s*treamline the Commission's licensing process by providing a predictable, efficient, and timely licensing process that continues to ensure adequate resource protections.*" To date, any reasonable analysis of Brookfield's participation in the Ripogenus - Penobscot Mills relicensing process indicates that Brookfield is attempting to delay and confuse the process by failing to provide the data required by FERC with the PAD, and then rejecting study requests involving the data.

**The Commission's Opportunities**

The FERC process has developed over the years to provide an orderly process leading toward licensing or relicensing of an energy project. 18 CFR § 5.6 clearly defines what information the applicant should provide in the PAD. Instead of providing it, Brookfield referenced studies conducted over 30 years ago and proposed to fill "data" gaps. Stakeholders submitted requests for the information in their PAD comments; Brookfield's response was to concentrate on the study requests and instead of providing the requested information in a usable form, to provide or reference old studies. This is not how relicensings are generally conducted under the ILP, whether or not the relicensing is the first conducted after passage of Electronic Consumers Protection Act (ECPA).

We appreciate FERC staff's recognition that the terms "dry way" and "back channel," used by Brookfield to refer to dewatered sections of the main stem of the West Branch, are inappropriate. We also applaud SD2 as a significant step in the right direction and expanding significantly on the limited scope that Brookfield had proposed. Brookfield's response was to issue a Proposed Study Plan that only accepted three studies as submitted. In a number of cases, studies are rejected that are clearly indicated by the SD2 as within the scope of FERC's planned NEPA analysis, yet Brookfield is not committing to completing studies that will address the data gaps and scope provided by SD2. For example, SD2 identifies that the NEPA analysis will seek to understand the effects of the projects on angling access/opportunities on the project impoundments, yet the PSP provides for no methodology or approach within the recreation study to specifically survey or assess the impact to and quality of angling on the impoundments and this information cannot be ascertained solely through spot counts and a facility assessment. Comparable, SD2 indicates that the NEPA analysis will assess the effects of the projects on angling opportunities for landlocked salmon and brook trout in the riverine reaches, which cannot be adequately assessed using the PSP's methodology which includes only site assessments and spot counts.

Furthermore, in arguing that study requests lack a nexus to project effect, the licensee relies on the *Centralia* decision (*City of Centralia v FERC*, 213 F.3d 742, 749 (D.C. Cir., 2000)) to argue that certain studies are an attempt to search for a problem where there is no evidence that problem exists. The licensee's reliance on *Centralia* is misplaced. That case concerned a post-license study of the need for a tailrace barrier net where there was substantial evidence in the record that the barrier net was unneeded. There the court found that the project effects of the discharge on fish were entirely speculative. Similarly, in *City of Jackson, Ohio*, 105 F.E.R.C. ¶61,136 n.9 (2003), a FERC decision on which the licensee relies, likewise involved a post-license study to assess whether the project was having an adverse effect on fisheries resources. This decision is inapplicable to circumstances such as are present on the West Branch of the Penobscot where the effect of the project on a protected resource is clear and the study is designed to evaluate the extent of that impact so that FERC can complete its NEPA review based on its scoping document. *FPL Energy Maine Hydro, LLC*, 95 F.E.R.C. ¶61,106 n.15 (2001)

and *Allegheny Energy Supply Company, LLC*, 109 F.E.R.C. ¶61,028, 61,117 (2004), also cited by the licensee, likewise involved the need for a license condition requiring a post-license study of project effects on fish. Each of these cases is inapposite to the study requests on the West Branch.

The licensee endeavors to extend the holding in *Centralia* and subsequent FERC decisions to argue against requiring studies *during* the pre-application phase of the Integrated Licensing Process (ILP) to limit the information available to FERC for its NEPA analysis. FERC's nexus requirement in its study criteria was not intended to create a barrier to study of project effects on resources that are within FERC's power to address in a license condition. In effect, the licensee's circular logic would require prior study in order to justify the need for a study while prior study makes the need for a study unnecessary. To meet FERC's nexus criteria, a proposed study need only show that the project has a direct or indirect effect on a non-developmental resource that will be evaluated by FERC as part of its environmental assessment. This Catch-22 scenario was certainly not what Congress intended when the Electric Consumers Protection Act amended the Federal Power Act to require that FERC "shall give equal consideration to the purposes of energy conservation, the protection, mitigation of damage to, and enhancement of, fish and wildlife (including related spawning grounds and habitat), the protection of recreational opportunities, and the preservation of other aspects of environmental quality." 16 U.S.C. § 797(e).

The circumstances surrounding the *Centralia* decision are different from those surrounding the Ripogenus - Penobscot Mills relicensings. Brookfield has applied the phrase "*where evidence of a problem has not been shown"* to a number of study requests. The dewatering large areas of Maine's third largest lake for months at a time, dewatering its most dramatic gorge or a 4.5 mile section further downstream, or abruptly reducing flows from about 2000 cfs to 400 cfs or lower stranding fish and macro-organisms in the process, provides ample evidence that a problem exists.

**Conclusion and Requests**

Accordingly, we ask that:

- FERC require that Brookfield address these comments when evaluating each stakeholders' individual Proposed Study Plan Comments, and offer a Revised Study Plan that will inform the process with current information.

- FERC review the applicant's revised study plan immediately after issuance to ensure that all scope items included in SD2 will be adequately assessed in the proposed studies and that the revised study plan include methodologies that will close all data gaps. Should any gaps continue to exist between the scope of the NEPA analysis and the studies proposed by the applicant, FERC should require the applicant to update the revised study plan, before stakeholders are required to comment on the revised study plan.

- FERC staff consider these comments in making its Study Plan Determination and insist on a suite of studies that will inform the process in accordance with FERC guidelines pursuant to 18 CFR § 5.6 and avoid larger problems later in the relicensing process.

- FERC staff extend the deadline for comments on the Revised Study Plan to 60 days to allow the public to provide additional comments based on operations data and other information provided in the RSP that was not provided with the PSP.

Our organizations appreciate the opportunity to provide these preliminary comments on these important projects and hope that the Commission will act to allow the resource protection agencies to obtain a range of studies that can identify potential harms to the resource and thus enable the Commission to balance project harms and benefits.

Respectfully submitted,

Matthew Streeter
Maine Council Chair
Trout Unlimited

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club

Bob Nasdor
Northeast Stewardship & Legal Director
American Whitewater

Bill Houston
Designated Representative
Chesuncook Lake Camp Owners Association, Chesuncook Dam Camp Owners Association

Allison Economy, Esq., Rudman Winchell Law Firm
Legal Representative for
Allagash Gateway Campground and
Andre Emerson Cushing Corporation

Mailed copies to:

Connor Teskey CEO
Brookfield Renewable Partners L.P.
Brookfield Place, Suite 300
181 Bay Street
Toronto, ON M5J 2T3

Merimil Limited Partnership
Corporation Service Company
45 Memorial Circle
Augusta, ME 04330

F. Mitchell Davidson, CEO
Brookfield Renewable - US
Brookfield Power US Holding America Co.
200 Liberty Street, 14th Floor
New York, NY 10281

Brookfield Power US Asset Management LLC
Brookfield White Pine Hydro, LLC
200 Donald Lynch Bvld, Suite 300
Marlborough, MA 01752

Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462

Randall Dorman
Licensing Manager, Brookfield Renewable
150 Main Street
Lewiston ME 04240

Ms. Kimberly D. Bose February 12, 2022
Secretary,
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426. VIA Electronic Filing

**Reference: Ripogenus Hydroelectric Project (P-2572-133)**

Subject: A study Request; Ramping and the Need to Determine the Appropriate Rate of Flow Change Below McKay Station on the West Branch of the Penobscot River.

GLHA's PAD issued June 11, 2021 states "there have been no changes to Project operations". Regarding the 1996 License and FERC conclusions on the status of fish and aquatic communities "GLHA maintains that nothing has significantly changed that would alter this conclusion." GLHA continues its pipedream/negotiation strategy by stating "GLHA maintains that a full suite of new studies is not needed, that the vast body of information on which today's certifications and licenses are soundly based and should be relied upon for these relicensing". Given the dramatic change in project operations, other than providing critical baseline information, forty-year-old data is useless in determining the 2022 status of the present fish and aquatic communities and angler use.

To those of us who have stood along the West Branch of the Penobscot River (West Branch) in recent years, GLHA's PAD comments are insulting, as we have witnessed the dramatic flow increases in the mornings followed by sudden decreases in the evenings. The Licensee often references protection, mitigation, and enhancement (PM&E) measures, given the current flow management and ecological degradation, this seems miss-leading and inappropriate. Project operations have changed dramatically and the results are a biological disaster. In order to identify existing fish and aquatic invertrabrates population compositions, many studies are needed and a water use plan needs to be independently developed. The status of fish and aquatic communities as well as angler use, effort and catch are required.

One of the needed studies deals with water management and ramping. A ramping study would determine the rate in which flow can be increased or decreased (over time). Fish and aquatic communities are vulnerable to sudden increases and decreases in flow that disrupt movement and feeding as well as strand fish and aquatic insects at all life stage. Resulting losses have a major impact on the riverine ecosystem. The requirement of studying and then determining ramping rates below all project facilities will benefit fish and aquatic communities.

In my October 1,2021 FERC filing, I provided a number of general comments on stream flow management. Thus, a small part of the following maybe redundant but never the less, the proof of habitat degradation remains highly relevant to river management.

The literature is replete with references on Hydro peaking, sometimes referred to as “pulsed power”. Peaking flows impact both fish, landlocked salmon (salmon), the principle West Branch salmonid, and brook trout as well as macro invertrabrates and plankton. Salmon populations exist in the Northeast, mostly in Maine where they are native (as they are in several eastern Canadian waters). Data base references to salmon and flow manipulation are limited. Brown trout (Salmo trutta) are similar to salmon in life history requirements including habitat and food selection. Thus, some of impacts of flow fluctuation on salmon are based on references developed from brown trout studies.

In Maine, useful information about flow and flow alteration on salmon movement (telemetry) is limited to the riverine area below Harris Station (Indian Pond FERC P-2142). Licensing study results demonstrated lateral movement in response to peaking flow but insignificant up and down stream movement (fish remained near their pre-peaking location). **A Canadian study by of landlocked salmon and trout in a medium size stream (88 cfs) used EMG coded transmitters, Enders et al. (2007). The authors found adult landlocked salmon preferred faster flow and deeper pools in the main channel, and “that fish effectively chose microhabitats that allowed them to reduce energy expenditures associated with movements.” Scruton et al (2011) studied juvenile Atlantic salmon below an experimental hydroelectric station in Newfoundland CA. and reported that altered flows caused behavioral changes. The staterogy of moving to a “microhabitat” assumes suitable habitat exits and is both in proximity and unoccupied. In the**

**high velocity gorge below McKay Station, these refugia/microhabitats are limited.**

**Additional information on peaking and its impact on salmonids provides support for the very limited studies of salmon discussed above. Quinn and Kwak (2011) found brown trout (Salmo trutta) and rainbow trout (Orcorhychus mykiss) were found in velocity refugia near an Ozark river's margin during high flow. Ayllon et al (2008) found that age I+ and older brown trout moved in response to the flow and velocity changes. Lagarrigue et al (2002) found reduced brown trout abundance below a hydro peaking system when compared to an upstream "control site" in the French Pyrénées and noted the shift in brown trout diel feeding activity in response to peaking flows. While numerous studies suggest that peaking operations have little effect on up or downstream movement, lateral movement and habitat selection in response to flow alterations requires energy as well as reducing salmon feeding activity, growth and predator avoidance.**

**During the 1992 licensing of Ripogenus Project, Juvenile salmon production was identified as the factor that limited the West Branch adult salmon population. The construction and operation of the Holbrook bypass nursey channel (dewatered many times in 2021) was a license condition (WQC Article 406) designed to mitigate the lack of West Branch juvenile salmon habitat. Present project peaking operations eliminate/reduce juvenile salmon production in both the Holbrook bypass area and all riverine reaches, a PM&E measure lost. Bauersfeld (1978) studying west coast salmon estimated *a 1.5% fry loss per drawdown with a total loss of 59% of the salmon fry population for one season*. Scurton et al. (2011) and Young et al. (2011) echoed similar concerns while Haakon et al. (2021) described the degree of impacts e.g., growth and abundance, caused by various flow changes on Norwegian juvenile salmon in Norwegian rivers.**

**The above paragraphs document the complexities of salmonid life histories as related to peaking flows. Salmonid movement, feeding habitats and velocity refugia need to be identified and incorporated in studies designed to enhance McKay Station biological flow requirements (minimum, peaking). Obviously, understanding of seasonal and diel behavior is also required. It should be noted**

**that the licensee's timing of early morning peaking and early evening sudden reduction of flow coincides perfectly with the timing of (natural) macro invertrabrate drift (currently, this timing is unknown) and peak salmonid movement and feeding activity.**

**Not discussed in the above fisheries references are the West Branch anglers. Present operations and hydro peaking limit the physical process of fishing e.g., drift boat, canoe or wade fishing, as well degrading the condition and abundance of salmon (and brook trout). From my many trips to the West Branch in the last few years, there are fewer anglers. Those anglers fishing from July though September were concentrated in the reach between McKay Station and the Big Eddy. Any ramping study should evaluate angler use and fishing opportunity.**

**The Literature is replete with reference to peaking flow and impacts on macro invertrabrates communities and plankton. Angradi and Kobly (1995) referenced dewatering impacts on the epilithon (algae, plant matter) in the Colorado River. As shown below, repeated dewatering reduced the food source of macro invertebrate grazers.**

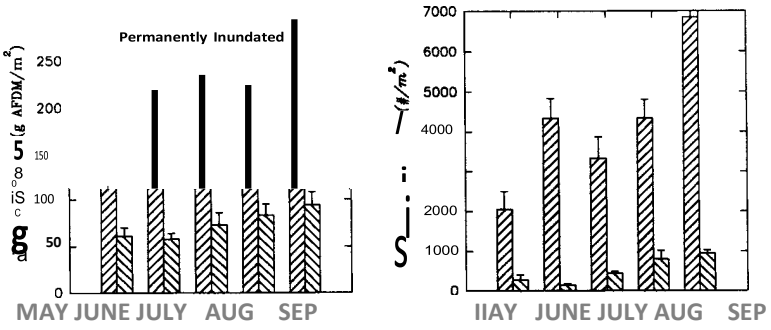


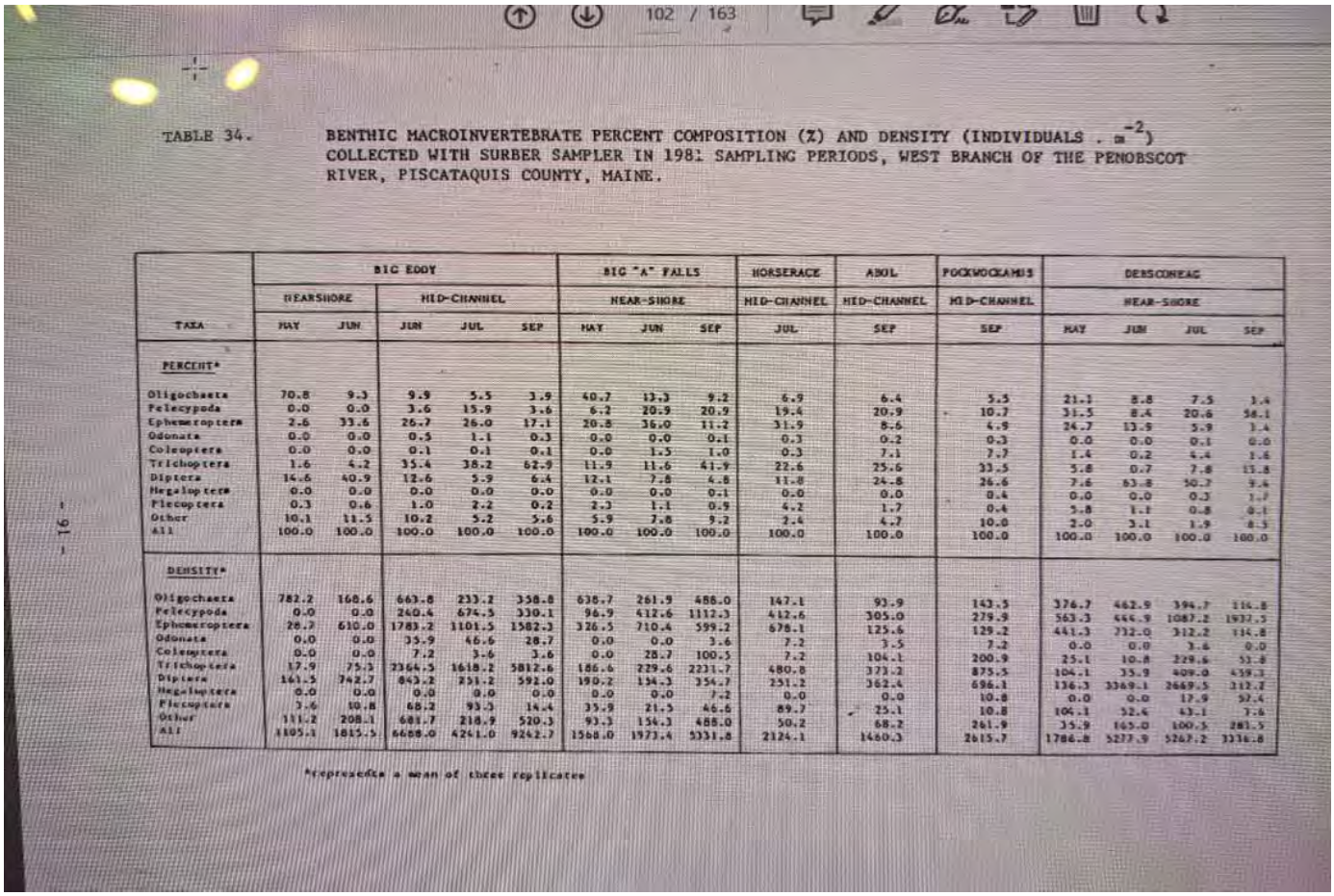

**Figure 9. Epilithon biomass and density of *Gammarus lacustris* in the permanently inundated and fluctuating flow littoral zones at 14 Mile Bar in 1992. Epilithon biomass values are means (SE) values *(n* = ;;i, 10) for samples collected usinl the same methods as for exposure experiments. *Gammarus lacustris* densities [mean (SE); *n* = 8] are from Hess samples (0·087m) collected at 14 Mile Bar**

**Macro invertrabrates are less mobile than fish and thus more vulnerable to peaking flows. The result is reduced abundance and the loss of velocity-sensitive species. Trotsky and Gregory (1974) described peaking and the resulting impact on River Kennebec aquatic communities below Wyman Dam. Moog (1993) describe the effects of peaking on macro invertrabrates and fish in Austrian rivers. Patterson, R. and K. Smokorowski (2011) studied macro-**

**inveterate drift on Magpie and Batchawana Rivers and summarized the available literature "Frequent and rapid fluctuations in flow can constitute a major factor contributing to the decrease in macroinvertebrate abundance and diversity in areas close to the dam (Cushman, 1985;Camargo and Voelz, 1998), with many studies observing drastic declines or elimination of macroinvertebrate communities in sections nearest a dam's discharge (Gore,1977; Boon, 1993; Growns and Growns, 2001; Vinson, 2001; House, 2002)." Lagarrigue et al (2002) who studied French Pyrenese rivers, stated "The flushing action of peaking flows caused a catastrophic drift, which was highest in autumn when the difference between natural and peak flows was greatest.** ***Overall drift density was higher below the hydro facility than in the control site above the facility where there was a clear diel pattern of drift, with low drift density during the day and high drift density at night, whereas no clear diel pattern was observed at below the hydro facility. Below the station, drift pattern appeared to be influenced most by hydropeaking".***

**Benthic macroinvertebrates are a standard used for biomonitoring purposes, and are known to demonstrate high sensitivity to flow alteration (Monk et al., 2006; Armanini et al., 2011), including clear responses to hydropeaking events, such as altered out-migration rates (drift) and shifts in density and biomass. Belmar et al., (2010) referenced the loss of taxa resulting from flow alteration.**

**A critical food source for salmon inhabiting the high gradient, ledge/boulder upper one and a half mile of the West Branch is hydropsychidae caddis (Trichoptera). During the 1980s macroinvertebrate sampling, Hydropsychidae caddis dominated upriver collections (see table below). Juvenile salmon prey on these net spinning caddis and caddis pupae and moths provide food to adult salmon during their late summer (August to mid-September) maintence period. Fuller and Fry (1991) report that diatoms are a favored food item among planktonic drift, growth increase with higher temperatures (20c) and that some species may be bivoltine (two annual generations). As Hydropsychidae prefer rocks, boulders and ledge for netting sites, they are vulnerable to sudden shifts in flow. Thus, present project operations are not only flushing caddis nets from marginal substrates but lake level management (or lack thereof) is reducing plankton availability as drift (food) through McKay Station.**



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TABLE 34. BENTHIC MACROINVERTEBRATE PERCENT COMPOSITION (%) AND DENSITY (INDIVIDUALS . $m^{-2}$) COLLECTED WITH SURBER SAMPLER IN 1981 SAMPLING PERIODS, WEST BRANCH OF THE PENOBSCOT RIVER, PISCATAQUIS COUNTY, MAINE.

| | BIG EDDY | | | | | BIG "A" FALLS | | | HORSERACE | ABOL | POCKWOCKAMUS | DEBSCONEAG | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NEARSHORE | | MID-CHANNEL | | | NEAR-SHORE | | | MID-CHANNEL | MID-CHANNEL | MID-CHANNEL | NEAR-SHORE | | | |
| TAXA | MAY | JUN | JUN | JUL | SEP | MAY | JUN | SEP | JUL | SEP | SEP | MAY | JUN | JUL | SEP |
| PERCENT* | | | | | | | | | | | | | | | |
| Oligochaeta | 70.8 | 9.3 | 9.9 | 5.5 | 3.9 | 40.7 | 13.3 | 9.2 | 6.9 | 6.4 | 5.5 | 21.1 | 8.8 | 7.5 | 3.4 |
| Pelecypoda | 0.0 | 0.0 | 3.6 | 15.9 | 3.6 | 6.2 | 20.9 | 20.9 | 19.4 | 20.9 | 10.7 | 31.5 | 8.4 | 20.6 | 56.1 |
| Ephemeroptera | 2.6 | 33.6 | 26.7 | 26.0 | 17.1 | 20.8 | 36.0 | 11.2 | 31.9 | 8.6 | 4.9 | 24.7 | 13.9 | 5.9 | 3.4 |
| Odonata | 0.0 | 0.0 | 0.5 | 1.1 | 0.3 | 0.0 | 0.0 | 0.1 | 0.3 | 0.2 | 0.3 | 0.0 | 0.0 | 0.1 | 0.0 |
| Coleoptera | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.0 | 1.5 | 1.0 | 0.3 | 7.1 | 7.7 | 1.4 | 0.2 | 4.4 | 1.6 |
| Trichoptera | 1.6 | 4.2 | 35.4 | 38.2 | 62.9 | 11.9 | 11.6 | 41.9 | 22.6 | 25.6 | 33.5 | 5.8 | 0.7 | 7.8 | 11.8 |
| Diptera | 14.6 | 40.9 | 12.6 | 5.9 | 6.4 | 12.1 | 7.8 | 4.8 | 11.8 | 24.8 | 26.6 | 7.6 | 63.8 | 50.7 | 9.4 |
| Hegaloptera | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 8.4 | 0.0 | 0.0 | 0.3 | 1.7 |
| Plecoptera | 0.3 | 0.6 | 1.0 | 2.2 | 0.2 | 2.3 | 1.1 | 0.9 | 4.2 | 1.7 | 0.4 | 5.8 | 1.1 | 0.8 | 0.1 |
| Other | 10.1 | 11.5 | 10.2 | 5.2 | 5.6 | 5.9 | 7.8 | 9.2 | 2.4 | 4.7 | 10.8 | 2.0 | 3.1 | 1.9 | 8.5 |
| All | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| DENSITY* | | | | | | | | | | | | | | | |
| Oligochaeta | 782.2 | 168.6 | 663.8 | 233.2 | 358.8 | 638.7 | 261.9 | 486.0 | 147.1 | 93.9 | 143.5 | 376.7 | 462.9 | 394.7 | 116.8 |
| Pelecypoda | 0.0 | 0.0 | 240.4 | 674.5 | 330.1 | 96.9 | 412.6 | 1112.3 | 412.6 | 305.0 | 279.9 | 563.3 | 444.9 | 1087.2 | 1932.5 |
| Ephemeroptera | 28.7 | 610.0 | 1783.2 | 1101.5 | 1582.3 | 326.5 | 710.4 | 599.2 | 678.1 | 125.6 | 129.2 | 441.3 | 732.0 | 312.2 | 114.8 |
| Odonata | 0.0 | 0.0 | 35.9 | 46.6 | 28.7 | 0.0 | 0.0 | 3.6 | 7.2 | 3.5 | 7.2 | 0.0 | 0.0 | 3.6 | 0.0 |
| Coleoptera | 0.0 | 0.0 | 7.2 | 3.6 | 3.6 | 0.0 | 28.7 | 100.5 | 7.2 | 104.1 | 200.9 | 25.1 | 10.8 | 229.6 | 53.8 |
| Trichoptera | 17.9 | 75.3 | 2364.5 | 1618.2 | 5812.6 | 186.6 | 229.6 | 2231.7 | 480.8 | 373.2 | 875.5 | 104.1 | 35.9 | 409.0 | 459.3 |
| Diptera | 161.5 | 742.7 | 843.2 | 251.2 | 592.0 | 190.2 | 154.3 | 354.7 | 251.2 | 362.4 | 696.1 | 136.3 | 3349.1 | 2649.5 | 312.2 |
| Hegaloptera | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.2 | 0.0 | 0.0 | 10.8 | 0.0 | 0.0 | 17.9 | 57.4 |
| Plecoptera | 3.6 | 10.8 | 68.2 | 93.5 | 14.4 | 35.9 | 21.5 | 46.6 | 89.7 | 25.1 | 10.8 | 104.1 | 32.4 | 43.1 | 7.6 |
| Other | 111.2 | 208.1 | 681.7 | 218.9 | 520.3 | 93.3 | 154.3 | 488.0 | 50.2 | 68.2 | 261.9 | 35.9 | 165.0 | 100.5 | 281.5 |
| All | 1105.1 | 1815.5 | 6688.0 | 4241.0 | 9242.7 | 1568.0 | 1973.4 | 5331.8 | 2124.1 | 1460.3 | 2615.7 | 1786.8 | 5277.9 | 5267.2 | 3334.8 |

*represents a mean of three replicates

**Many/most of recent licenses for hydro-electric operations contain ramping prescription. Marty et al (2009) in a Magpie River study sponsored by Brookfield Renewal Energy (in effect, the licensee) reported ramping improved aquatic communities when compared to populations that were subject to unramped flows. Up and down ramping have been shown to modify the devasting effect of peaking. In its October 8, 2021 filing the Maine Department of Inland Fisheries and Wildlife commented on peaking operations and suggested ramping.**

**"Peaking power operations were not discussed in the WUP for the current license and were not anticipated. The literature is replete with examples of the detrimental impacts on the riverine fisheries and aquatic communities from rapid changes in flow. Flow changes of less than 25% per hour (ramping rate) can mitigate impacts from peaking power."**

**I agree, however given the high gradient of the area between McKay Station and the Big Eddy, some confirmation of an appropriate ramping rate is needed. With the dramatic change in project operations, by June, the adult salmon population is now concentrated in this reach and as demonstrated above, salmon prey items e.g., hydropsychid caddis, are vulnerable to dramatic flow change. Conservative (to the resources) measures are required.**

**A number of licenses/401 WQC filings provided ramping rates associated with their facilities. These prescriptions are quite variable both in rates and season;**

| Water | Ramping rate | | | | Target |
|---|---|---|---|---|---|
| | Spring | Summer | Winter | Fall | |
| Sultan River WA | 15 cm h-1 | 2.5 cm h-1 | 15 cm h-1 | | fry |
| Magpie River ONT | 25% from previous hour | | ---2 m3 s1 h1 | 1 m3 s1 h1 | fish & bugs |
| Snake River Idaho | Up or down… 50 cfs every half hour; from 0700 -1700 h only | | | | |
| Way Dam Wisc | 20% of current flow in 2 hour period, no more than 50% in 24 h | | | | |

**PacifiCorp Energy must limit Project-induced ramping of river stage as follows:**

| Project Reach | May 1 – September 30 | October 1- April 30 |
|---|---|---|
| Middle Fork Rogue River | Target of 1 inch per hour, not to exceed 2 inches per hour | Target of 2 inches per hour, not to exceed 3 inches per hour |
| Red Blanket Creek | Target of 1 inch per hour, not to exceed 2 inches per hour | Target of 2 inches per hour, not to exceed 3 inches per hour |
| North Fork bypassed reach | The target ramp rate is 100 CFS increase or decrease per 30 minutes, not to exceed 130 CFS per 30 minute interval. | |
| Rogue River below Powerhouse # 2 | The target ramp rate is 100 CFS increase or decrease per 30 minutes, not to exceed 130 CFS per 30 minute interval | |

Many other literature references to flow management and ramping exist. Peaking below Brookfield Renewable Energy's Brassua Lake Dam (FERC Project P2615) and the Moose River is prohibited from the end of "spring spill" to the end of June. Down ramping is a section 401 WQC, article 401 condition for Caucomgomoc Lake Dam, an impoundment of the Licensee's Storage Project (P-2634). The February 10, 2006 FERC order required flow reductions of no more than 50%/hour. While ramping rates vary, there are similar flow conditions that address extreme fluctuations in most recently licensed projects.

McKinney et al (2001) studied rainbow trout populations (stocked and wild fish) in the Colorado River below Glen Canyon Dam. Trout populations responded positively to an increased minimum flow and reduced daily flow fluctuation. Growth and abundance of wild trout improved following the 1991 modification of the flow regime. See below table.

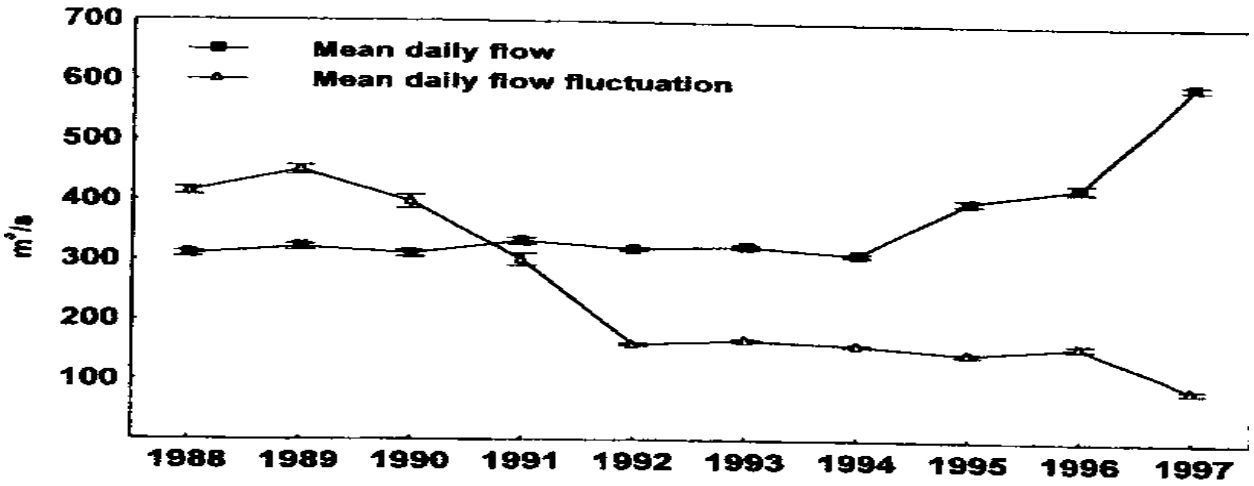



FIGURE 2.—Mean (±SE) annual daily flows and fluctuations from 1988 to 1997 of releases from Glen Canyon Dam, Colorado River.

The above paragraphs outline the complex relationship between salmon and aquatic communities in hydro peaking rivers. The Licensee included the 1992 FERC Ripogenus Project License application in the 2021 license application and FERC staff should use those data in comparison to 2022 study results. Many studies of the Ripogenus Impoundment and the West Branch below McKay Station are needed to define the present status of fish and aquatic

**communities. FERC approved studies should require an independent peer reviewed water management plan that includes an up and down ramping prescription protective of sensitive aquatic insects, namely hydropsychid caddis, and salmonids.**

**Thank you for the opportunity to comment.**

Ed Spear
307 Mt Hope Ave
Bangor, Me 04401
Phone 207-217-4288
Email: edspear1@yahoo.com

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Ms. Kimberly D. Bose February 12, 2022
Secretary,
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426. VIA Electronic Filing

**Reference: Ripogenus Hydroelectric Project (P-2572-133)**

Significant evidence has been provided by numerous stakeholders that, contrary to GLHA's statements, there has been significant change to the project operations, ecosystems, and landowner development in the project area since their last license was approved. All of which speaks to the obvious fact, that the prior data filed decades ago needs to be updated to reflect today's current environment.

There has been much discussion about what new data may be required to evaluate GLHA's license application, but there has been no discussion about what ongoing data monitoring will be required during a new license period. The new license period could be as long as 50 years stretching out to 2075. There have been significant advances in scientific understanding of the changing global climate conditions since the last license was approved. Governments around the world and global scientific organizations recognize this fact and we in this GLHA project area sadly are seeing its effects today in our lakes and rivers and the ecosystem at large as has been stated by numerous comments.

The studies that this Commission will determine are necessary for it to make an informed decision will be based on the conditions that exist **today**. The problem is these conditions are predicted to change significantly in the near future, in fact within the proposed new license period for the GLHA application.

Given these facts, the Commission should not regulate using the same operational assumptions as was done during the 20th century as they are no longer appropriate. Admittedly, these are very complex issues but the climate is not static and, in fact, the changes to it are accelerating. Therefore, I respectfully ask the Commission to establish certain key criteria that will be monitored throughout the new license period in order to ensure if the conditions the Commission determined were necessary to be met in order to approve the new

license, continues to be met, and if not, adjust operational requirements as appropriate.

Respectfully,

Charles Paone

jimmy busque, MILLINOCKET, ME.
The attempt to require Brookfield to put fish ladders in all their dams on the Penobscot river in Maine would have a very negative impact on our native brook trout and world class salmon fisheries. These fish ladders will give Northern pike and alwives a clear path to the east and west branch of the Penobscot and destroy some of the last remaining native brook trout fisheries in the country and also the world famous salmon fisheries on the west branch. I urge FERC to not require Brookfield to build fish ladders that will destroy our fisheries.

**UNITED STATES DEPARTMENT OF COMMERCE**
**National Oceanic and Atmospheric Administration**
NATIONAL MARINE FISHERIES SERVCE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic
Drive Gloucester,
MA 01930-2276

February 17, 2022

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**RE: Comments on Great Lakes Hydro America, LLC (GLHA) Proposed Study Plan for the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458)**

Dear Secretary Bose:

This responds to the November 22, 2021, Proposed Study Plan filed by Great Lakes Hydro America, LLC (GLHA) for the relicensing of the Ripogenus (P-2572) and Penobscot Mills Projects (P-2458) located on the West Branch of the Penobscot River in Maine. Our comments are attached and organized in such a manner to facilitate the Commission's review.

We appreciate your thorough consideration of the comments and look forward to working with GLHA and the Commission to develop an adequate Revised Study Plan for the Ripogenus and Penobscot Mills Projects. If you have any questions or need additional information, please contact Dan Kircheis at Dan.Kircheis@noaa.gov or 207-866-7320.

Sincerely,

Jennifer Anderson

Jennifer Anderson
Assistant Regional Administrator
for Protected Resources

cc: Service List

Attachment

**National Marine Fisheries Service's Comments on Great Lakes Hydro America, LLC November 22, 2021, Proposed Study Plan for the relicensing of the Ripogenus (P-2572) and Penobscot Mills Projects (P-2458)**

*The PSP Does Not Respond to NMFS or FERC's Additional Information Requests that are Necessary to Develop Study Plans for the Projects*

As stated in the Commission's March 2012 "Guide to Understanding and Applying the Integrated Licensing Process Study Criteria" (herein referred to as March 2012 Guide), Section 5.9(a) of the Commission's regulations provides parties the opportunity to request information to be gathered or to request studies. The March 2012 Guide states "The regulations do not differentiate between information requests and study requests. In practice, however, Commission staff treat additional information needs differently than study requests in that staff do not address the study criteria." The Commission's March 2012 Guide also states:

> "Additional information is information that is readily available and that can be provided to help clarify the proposal. Collecting this information should not rise to the level of conducting field work, performing a detailed analysis, or modeling to develop the data. This existing information should be relevant to the project proposal, is in the applicant's possession, or can be obtained with the exercise of due diligence. Staff often asks that this information be made available, preferably prior to scoping, but no later than issuance of the applicant's proposed study plan so as to effectively inform scoping and study plan development."

On October 8, 2021, we submitted our comments and study requests on GLHA's Notice of Intent to File License Application and Filing of Pre-Application Document for the Ripogenus and Penobscot Mills Projects. In our letter, we requested GLHA provide us additional information concerning operational data (daily minimum, maximum, and average flows) at all developments for the last ten years to determine impacts from operations to environmental resources including critical habitat designated for the Gulf of Maine distinct population segment of Atlantic salmon in the mainstem Penobscot River. These data are readily available to GLHA and necessary for project scoping. We specifically requested this data be submitted to us as part of the Proposed Study Plan.

On October 8, 2021, the Commission issued an Additional Information Request for detailed operations data needed to clarify how the projects are operated on a daily basis. Specifically, the Commission requested GLHA include as an appendix to the Proposed Study Plan, 10 years of operations data for each project, or each individual development, in the case of the Penobscot Mills Project, including: (1) Daily impoundment elevations; and (2) daily outflows (minimum, maximum, and average discharges). This request is consistent with the information requested by us, referenced in the paragraph above.

None of the data requested by us or the Commission were provided by GLHA in the November 22, 2021, PSP.

We note that the Commission revised their description of project operation at Millinocket, Dolby, and East Millinocket from "run-of-river" to "run-of-release" in the November 22, 2021, Scoping Document II. It appears that this change may have been informed by the Commission's receipt of additional guidance or information from GLHA; however, no such data or information has been provided to us. As noted in our October 2021 filing, this data is necessary to inform the development of proposed studies for the Ripogenus and Penobscot Mills Project. During the virtual PSP Meeting held on December 15-16, 2021, GLHA informed us they plan to treat our information request as a study request and that they intend to provide the requested information on April 22, 2023, as part of their proposed Historic Operations Data and Assessment Study. Given the need to fully understand current operational modes at the projects (i.e., run-of-river, run-of-release, or peaking), we also request GLHA provide us with hourly outflow data for McKay Station, North Twin, Dolby, Millinocket, and East Millinocket Projects for the last 10 years. Hourly data is needed for us to adequately scope the range of issues associated with this relicensing. This data, which is certainly readily available to GLHA and necessary to inform the development of study requests, should be provided to us and the Commission as soon as possible. Also, delaying the submission of these data for an additional fourteen months will irreparably impact the Commission's process plan and schedule that was outlined in Scoping Document II. Given that GLHA has ready access to this data, we request the data be provided to us within 14 days of this letter.

*The PSP Will Not Contribute to Developing an Adequate Environmental Report (Exhibit E) for the Projects*

In total, state and federal agencies and interested parties requested that GLHA conduct 35 studies to support the Commission's Integrated Licensing Process for the projects. GLHA's PSP outlines only eight new studies to support the relicensing of the Ripogenus and Penobscot Mills Project. At least two of the studies do not involve collecting any new data by GLHA. Instead, GLHA is proposing to support the relicensing of the Penobscot Mills and Ripogenus Projects by almost exclusively relying upon data collected by the previous owner of the projects during the prior relicensings which occurred over thirty years ago under a different mode of operation. It is our determination that if the studies are limited to those proposed in GLHA's PSP, significant gaps will exist and the licensee will not be able to prepare a complete and adequate Exhibit E to inform the Commission's development of their NEPA document. This would also hinder the ability of the resource agencies and the public to adequately evaluate the effects of the projects on resources of concern and impair the development of license conditions. Significant intervention from the Commission will be needed to develop a comprehensive PSP that remedies this situation.

As indicated in the March 2012 Guide , before the Commission can make an informed decision on a license application, it must obtain adequate information on the resources the project affects, such as soils, water quality, fish and wildlife, cultural, recreation, aesthetics, land use, and tribal resources. The Integrated Licensing Process was specifically designed to ensure that the information needs are known before a license application is filed through a Commission-approved study plan. Also, the Commission uses current conditions as its baseline for evaluating

project effects and alternatives. This consists of the environment as it exists *at the time of licensing* (emphasis added).

During the previous relicensing of the Ripogenus and Penobscot Mills Project, the former Licensee (Great Northern Paper Co. or GNP) conducted extensive studies and analysis to assess the effects of operating the projects on aquatic organisms and habitat within the West Branch of the Penobscot River. To develop their license applications for the Ripogenus and Penobscot Mills Projects, GNP collected environmental data from 1977 to 1990 prior to submitting the final licensing proposal to the Commission in December 1991. GNP studied the West Branch of the Penobscot River for thirteen years to document the baseline conditions of environmental resources within the various areas affected by the projects. GNP did this in the context of the previous mode of operation, to facilitate the Commission's preparation of the necessary NEPA analysis for the prior licensing action. We note that during that relicensing, baseline conditions were established to reflect GNP's 1991 Water Use Plan. GLHA summarized the previous relicensing studies in a letter to the Commission dated September 24, 2021. These data, however, cannot reliably be used to represent the current environmental conditions in the project areas because: 1) There is no information available in the record that indicates GLHA has operated the project pursuant to GNP's 1991 Water Use Plan since purchasing the projects in 2001; 2) GLHA indicated in the June 2021 PAD there are no plans to operate the projects in accordance with the 1991 Water Use Plan; 3) the previous relicensing did not attempt to assess the effects of operating the Ripogenus or Penobscot Mills Projects on aquatic resources in the mainstem Penobscot River and occurred prior to the designation of critical habitat for Atlantic salmon; and, 4) the closure of the Millinocket and East Millinocket Mills in 2008 have undoubtedly altered the environmental conditions of the West Branch of the Penobscot River. Therefore, given that the previous studies reflect a baseline related to a water use plan and operational scheme that has not been relevant since 2001, it is not reasonable to rely on those studies for this relicensing. The current environmental conditions within the project area are presently unknown and must be established as part of this relicensing in order for the Commission to adequately complete a NEPA analysis on the effects of the projects on the West Branch of the Penobscot River and mainstem Penobscot River.

*The PSP is Factually Flawed in Evaluating NMFS' Study Requests*

In our October 8, 2021, letter, we requested the following studies:

- A study to evaluate how the operations of the Penobscot Mills and Ripogenus Dam affects the hydrology of the West Branch and mainstem Penobscot River using an Indicators of Hydrologic Alteration Model;
- A study to evaluate project effects on river temperature in the West Branch and mainstem Penobscot River; and
- A study to evaluate future flow and water temperature scenarios.

The October 8, 2021, study requests for the Ripogenus and Penobscot Mills wholly conformed to the Commission's seven point criteria for submitting study requests as part of the Integrated

Licensing Process under 18 CFR 5.9(b). Nevertheless, GLHA did not adopt our requested studies based upon nonfactual and illogical reasoning which we respond to individually below.

I. Indicators of Hydrologic Alteration Model

We requested that GLHA conduct a study on the affected reaches of the West Branch of the Penobscot River to inform impoundment levels and operational management of dams, both individually and in the aggregate, that are protective of fish, water quality, riparian habitat, and other ecosystem functions. We requested that GLHA detail how their dams, impoundments, and operations currently modify hydrologic variables, including magnitude, timing, frequency, duration, and rate of change in West Branch of the Penobscot River down to the Mattaceunk Project so that FERC can evaluate how these hydrologic regime modifications impact sea-run fish, including Atlantic salmon, and their habitats. This information is necessary to inform the development of license conditions. We stated that the objective of the study is not to have FERC consider "pre-project" conditions in the analysis for this relicensing; rather, the objective of the study is to inform future license conditions that are protective of aquatic resources in the West Branch of the Penobscot River and areas downstream of the projects that are affected by project operations. The study would achieve this objective by contrasting current conditions with conditions that are protective of aquatic resources; this allows for identification of project operations that would be protective of aquatic resources.

To accomplish the study, we recommended GLHA utilize the Indicators of Hydrologic Alteration (IHA) and Range of Variability Approach (RVA) methods as described by Meridian 2004 and Richter et al. 1996, 1997. The IHA method provides a hydrologic analysis technique that considers the overall hydrological requirements of the system, rather than specific objectives such as a short list of species or geomorphic processes (Meridian 2004). In addition, the model defines a hydrologic regime that is more likely to maintain or restore the natural biotic composition, structure, and function of the river system (Meridian 2004). The RVA method was subsequently developed to provide a tool that establishes flow targets based on the results of IHA analysis and goals for meeting resource objectives (Meridian 2004).

In the PSP, GLHA did not adopt this study request. GLHA claims the study request did not conform to FERC's study criteria. We disagree and demonstrate below that we did conform with FERC's criteria. The Commission's March 2012 Guide provides a near exact example for establishing the nexus between operation of the Ripogenus and Penobscot Mills Project and Atlantic salmon critical habitat in the mainstem Penobscot River.

> "For example, say an entity requests a survey for a federally endangered fish species and its habitat downstream of an existing project that operates in a peaking mode; that is, the project generates during peak demand periods and stores water during off-peak periods such that there are fluctuations in water levels within the reservoir and downstream of the powerhouse. If one of the factors leading to the listing of the fish has been the loss of spawning habitat, the study proponent could easily demonstrate a nexus between the presence of the fish or its habitat downstream of the project and the project's effect on spawning habitat due to fluctuating flows from its peaking operation. If the study found the listed species within the affected reach but in low numbers compared to comparable unregulated reaches, the new license might include

measures to improve spawning habitat such as modifications in the timing and magnitude of releases or habitat improvements in the affected reach. If spawning habitat is a cumulatively affected resource in the basin, the requested project-specific information would also help staff conduct its cumulative effects analysis."

GLHA states in Volume 1 of the PAD, Section 1.6, that the impoundments and operations modify flows in the mainstem Penobscot River. Specifically, "The Project storage impoundments are managed on an annual cycle to dampen the variability and occasional extremes of seasonal precipitation and runoff through storage within the impoundments. This storage allows for continuous flows to downstream aquatic habitat and spawning areas within the West Branch and the mainstem of the Penobscot River during times of lower inflows to the system. In addition, the storage allows flows from the West Branch to be reduced during higher seasonal flow periods when the combined flows from the East and West Branches have the potential to adversely impact human life, property, and environmental resources downstream along the mainstem Penobscot River."

GLHA acknowledges that operation of the Penobscot Mills and Ripogenus Projects affects the mainstem of the Penobscot River. Project impoundments and flow management that affect flows in the mainstem may have direct effects on sea-run fish, including endangered Atlantic salmon; therefore there is a clear project nexus and a full analysis of project effects on flows in the mainstem should be conducted. As such, we disagree with GLHA's conclusion that our study request does not conform to the Commission's study criteria under the Integrated Licensing Process.

Below, we respond to several specific claims asserted by GLHA in the PSP pertaining to our requested IHA study.

In rejecting our study request, GLHA claims that conducting an IHA study on the West Branch or any other reach of a highly regulated river system such as the Penobscot River, is both inappropriate and unnecessary. GLHA also claims that an IHA model will not provide any useful information regarding the effects of Project operations on Atlantic salmon or other diadromous fish species. We disagree with both of these claims, as explained below.

<u>GLHA's Claim the IHA Study is Unnecessary</u>
Data collected during the past relicensing is not applicable to this relicensing since the mode of operation has changed from powering paper mills to maximizing electrical output to ISO New England. Furthermore, since GLHA has no plans to operate the projects in accordance with the 1991 Water Use Plan, the environmental baseline and GLHA's current mode of operating the projects must be evaluated as part of this licensing proceeding. Furthermore, this study will allow the Commission to evaluate alternative operations of the Ripogenus and Penobscot Mills Projects in their NEPA analysis.

GLHA also asserts our study request is not necessary because existing information is sufficient to answer the questions posed. GLHA argues the study is not necessary because river flows were evaluated at the Mattaceunk Project located on the mainstem Penobscot River approximately 13 kilometers downstream of the confluence of the West and East Branches of the Penobscot River. GLHA attempts to draw similarities between different projects that operate in different modes (i.e, run-of-river vs. run-of-release vs. peaking), to support the assertion that "existing information is sufficient." There is no data presently available that assesses how operation of the Ripogenus or

Penobscot Mills Projects impacts habitat for anadromous species including endangered Atlantic salmon in the mainstem Penobscot River. Data collected during this study will be used to fully evaluate existing operations (which presently remain unknown) compared to alternative modes of operating the projects for the protection of aquatic habitat and resources in the mainstem Penobscot River.

GLHA's Claim that the IHA Study is Inappropriate

Although the March 2012 Guide indicated that it is not necessary to demonstrate with "certainty" that a study will result in a license condition since it is premature at this stage in the process, we are fully confident that our requested IHA study will inform license conditions that will serve to protect Atlantic salmon and their critical habitat in the mainstem Penobscot River.

Last, the Commission has approved and/or required an IHA assessment as part of the relicensing of at least 10 hydroelectric projects undergoing relicenings include: Jackson (WA) (P-2157); McCloud-Pit (CA) (P-2106); Drum-Spaulding/Yuba-Bear (CA) P-2310, P-2266, P-2784; Merced (CA) (P-2179); Snohomish County PUD No.1 (WA) (P-14295); Bucks Creek (CA) (P-619); Skagit (WA) (P-553); Phoenix (CA) (P-1061). Therefore, it is reasonable to conclude that the Commission can consider IHA studies to be appropriate and necessary. As stated in the March 2012 Guide, "models are useful tools for conducting an analysis of effects and alternatives, and can help determine the scope of issues and corresponding analysis. Commission staff will consider any study requests that propose the use of operation models in accordance with the study criteria and will require their use as appropriate." Our study request proposes the use of operation models in accordance with the study criteria and it is our assessment that the use is appropriate here.

II. Project Effects on River Temperature in the West Branch

We requested a study to "Evaluate Project Effects on River Temperature in the West Branch and Mainstem of the Penobscot River." It is our assessment that because the West Branch drains 24 percent of the entire Penobscot Basin (NMFS, 2009) and approximately 57 percent of the river is impounded by dams (USACOE, 1990), the modified flows resulting from the impoundments and operations of Ripogenus and Penobscot Mills may also modify water temperatures that could affect survival of sea-run fish, including endangered Atlantic salmon and their critical habitat. However, there is no information on which to base an analysis of these effects or to inform recommendations or requirements for project operations that would mitigate these effects. In the PSP, GLHA did not adopt this study request. Rather, GLHA claims the study request constitutes "basic research" and/or is not likely to inform the development of license conditions.

GLHA states in Volume 1 of the PAD, Section 1.6, that the impoundments and operations of the Ripogenus and Penobscot Mills Projects are used to modify flows in the mainstem Penobscot River. The controlled releases at the projects is designed to "dampen the variability and occasional extremes of seasonal precipitation" in the West Branch and mainstem Penobscot River (Penobscot PAD Vol. 1). It is reasonable to conclude that these flow manipulations directly affect Atlantic salmon and their critical habitat in the mainstem Penobscot River.

Presently, there is no information on the effects of current operations of the Penobscot Mills and Ripogenus Projects on ambient river temperatures in the West Branch of the Penobscot River or

mainstem Penobscot River. This information is necessary to inform potential license requirements to minimize the effects of project operations on water temperature and to ensure appropriate operational measures and procedures are in place to afford necessary protection of sea-run fish and their ecosystems that may directly impact survival of Atlantic salmon and other diadromous fish.

In the PSP, GLHA did not adopt this study request. In the PSP, GLHA claims the study request constitutes basic research and/or is not likely to inform the development of license conditions. We disagree. Studies to evaluate river temperatures do not constitute basic research. Further, 18 CFR §5.9 specifically states that an Applicant's PAD must provide data concerning seasonal variation of existing water quality data including water temperature for any stream, lake, or reservoir that would be affected by the proposed project. Temperature studies are necessary to understand how the project and its operations affect water temperatures and inform measures the licensee can take to offset adverse impacts in order to protect aquatic resources. We have determined that there is no current data on project impacts to temperature in the West Branch and mainstem because the current conditions and project operations have changed substantially since the last relicensing, and any previous temperature data is no longer relevant to the current relicensing.

Changing environmental conditions:
Environmental conditions have changed substantially since the last relicensing; therefore, any water temperature data collected previously is not informative of current conditions or conditions anticipated during any new licenses. We call attention to the Maine's Climate Future report produced by leading experts from the University of Maine's Climate Change Institute (Fernandez et al. 2020). The 2020 update describes how Maine's average annual temperature has increased 3.2 degrees in the last 124 years with most of that warming having occurred since 1960. The report goes on to state that the Northeast is warming faster than any other region in the U.S. In Northern Maine (the area that includes the entire West Branch Penobscot), the average annual temperature has increased approximately 3.1 $^{o}$F since 1895, of which approximately 1.4 $^{o}$F of that warming has occurred over the last 30 years.

Change in operations:
As we call attention to in the IHA study request, the previous relicensing did not attempt to assess the effects of operating the Ripogenus or Penobscot Mills Projects on aquatic resources in the mainstem Penobscot River and, the closure of the Millinocket and East Millinocket Mills in 2008 have undoubtedly altered the environmental conditions of the West Branch of the Penobscot River. It is reasonable to expect that these factors impact how project operations affect temperature in the West Branch and mainstem Penobscot. Therefore, the current environmental conditions within the project area are presently unknown and must be established as part of this relicensing in order for the Commission to adequately complete a NEPA analysis on the effects of the projects on the West Branch of the Penobscot River and mainstem Penobscot River. This information is also necessary to inform ESA consultation and develop recommendations/requirements for any new license. It is well documented that changes in streamflow, including dam impoundments and flow management through dams, can significantly affect water temperatures due to changes in thermal capacity, with water temperature being

inversely related to discharge (e.g. Webb et al. 2003). The Commission could certainly order GLHA to operate the project's outflows and impoundments in a manner to minimize affects to steam temperatures including relocating intakes to withdraw deeper, cooler waters in the project impoundments.

Impacts to Aquatic Resources:
As we stated in our study request, water temperature is one of the most important environmental factors affecting all forms of aquatic life in rivers and streams (Annear et al. 2004). Temperature is especially important for Atlantic salmon given that they are poikilothermic (i.e., their body temperatures and metabolic processes are determined by temperature). Temperature can be a stimulant for salmon migration, spawning, and feeding (Elson 1969). Temperature can also significantly influence egg incubation success or failure, food requirements and digestive rates, growth and development rates, vulnerability to disease and predation, and may be responsible for direct mortality (Garside 1973; Spence et al. 1996; Peterson et al. 1977, Whalen et al. 1999).

Based on the information currently available to us, we expect that these projects exacerbate the impacts of climate change by causing additional warming of the West Branch and mainstem Penobscot River. The dampening of flow variability and the storage of water in the large reservoirs created by the Ripogenus, North Twin, and Millinocket Dams changes the hydraulic conditions in the river downstream of the project. As we indicate above, it is well documented that changes in streamflow, including dam impoundments and flow management through dams, can significantly affect water temperatures due to changes in thermal capacity, with water temperature being inversely related to discharge (e.g. Webb et al. 2003).

The combined effect of increased stream temperatures associated with these operations along with a warming climate can negatively affect the reproductive success of salmonids (e.g. Mantua et al. 2010).

In summary, the significant increases in the average annual temperature since the last relicensing and the understanding that impoundments and changes in stream flow can significantly impact water temperature provides the basis for evaluating the project effects on river temperatures in the West Branch and the mainstem and identifying management measures that the licensee can take to offset these impacts.

III. Future Flow and Water Temperature Study

GLHA states in Volume 1 of the PAD, Section 1.6, that the impoundments and operations are used to modify flows in the mainstem Penobscot River. It is reasonable to expect that these modified flows may exacerbate the effects of climate change. The operations of the Penobscot Mills Projects and Ripogenus Dam reduce the magnitude and frequency of flow variability throughout the Penobscot (GLHA 2021). Changes in streamflow, including dam impoundments and flow management through dams, significantly affect water temperatures due to changes in thermal capacity with water temperature being inversely related to discharge (Webb et al. 2003). The combined effect of a warming climate along with altered stream flows can negatively affect the reproductive success of salmonids (e.g. Mantua et al. 2010). An IHA analysis of how these

dams and their operations may exacerbate potential future climate conditions (e.g. extreme drought, flood events, extreme temperatures) and identification of mitigating measures that can be taken to offset these impacts, in conjunction with this temperature study request, is necessary to inform potential license requirements.

GLHA contends that the future flow and water temperature study request constitutes basic research and/or is not likely to inform the development of license conditions. We disagree. The licensee states that they already have the operational flexibility to accommodate annual and seasonal hydrologic variations. Yet they have not demonstrated if and how they are exercising this flexibility to ensure adequate protection of the natural resources affected by their projects. This is clearly articulated in the large number of comments on the PAD that describe extreme lake level changes in Ripogenus, and inconsistent, highly variable flows that has had adverse impacts on fisheries in the West Branch. To date, the licensee has been unwilling to provide the flow data necessary to demonstrate otherwise.

Future flow and temperature conditions are likely to change over the term of the next license as climate conditions continue to change. In order to protect aquatic communities in the Ripogenus and Penobscot Mills Project areas, the Commission will need to develop operational scenarios that are able to respond to these changing climate conditions, like those that resulted in extreme low lake levels in Ripogenus during the summer of 2021. The best available science states that the climate in Maine is warming and will continue to warm, and as a consequence, precipitation types, rates and duration will continue to change (Allen et al. 2021; Fernandez et al. 2020). Specifically, the 2021 *IPCC report on Climate Change* (Allen et al. 2021) projects that the Northeast U.S. will trend towards warmer and wetter, and the University of Maine's Climate Change Institute reports that Northern Maine's average annual temperature has increased by 3.1º F since 1895, and approximately 1.4 ºF over the last thirty years (Fernandez et al. 2020). The science is clear that the most plausible climate future will be one that is warmer, likely leading to continued changes in precipitation rate, intensity, and duration as well as snowpack and the timing of the spring snow melt. All of these factors impact the operations of these projects and their ability to adequately protect aquatic resources throughout the West Branch and mainstem Penobscot. Accordingly, the future flow and temperature study is necessary to obtain the information required to respond to likely future climate scenarios through the development of operational plans and procedures, in the form of license conditions, necessary to ensure protection of the natural resources throughout the Penobscot River.

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UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

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| Great Lakes Hydro America, LLC<br>Application for New License | Ripogenus Hydroelectric Project<br>FERC No. 2572<br>Penobscot Mills Hydroelectric Project<br>FERC No. 2458 |

# AMERICAN WHITEWATER AND APPALACHIAN MOUNTAIN CLUB COMMENTS IN RESPONSE TO PROPOSED STUDY PLAN FOR THE RIPOGENUS HYDROELECTRIC PROJECT (P- 2572) AND PENOBSCOT MILLS HYDROELECTRIC PROJECT (P-2458)

American Whitewater ("AW") and Appalachian Mountain Club ("AMC") submit the following Comments in response to the filing of the Proposed Study Plan for the Ripogenus Hydroelectric Project and Penobscot Mills Hydroelectric Project (FERC Project Nos. P-2572, P-2458) by Great Lakes Hydro America, LLC ("GLHA").

AW and AMC have long been involved with the FERC licensed hydropower projects in Maine, including hydropower projects located on the Penobscot, Kennebec, Rapid, and Magalloway rivers, and are party to settlement agreements that provide for whitewater boating opportunities that partially mitigate for project impacts. Our organizations participated in the initial scoping meeting and filed comments and study requests for these Ripogenus and Penobscot Mills projects. We file these comments to address the deficiencies in GLHA's Proposed Study Plan in relation to study requests by our organizations and other stakeholder in the FERC relicensing to adequately understand the aesthetic, ecological and recreational impacts of project operations in, below and in proximity to  the project boundary.. We request that the licensee consider these comments along with those filed by FERC, resource agencies, and other stakeholder groups in developing a Revised Study Plan that will provide information that will inform the environmental analysis of project effects on non-developmental resources.

## I. Comments on Scoping Document 2 (SD2)

The PSP was filed by the applicant nearly concurrent with the filing of SD2, issued by FERC. Understandably, the development of the PSP was not fully informed by SD2 due to the timing of these filings. At the December 15 and 16, 2021 PSP meeting, many stakeholders raised questions about the needed revisions in the study plan to reflect the updated scope of the NEPA analysis as provided for in SD2 with no commitments by the applicant to provide a RSP that reflects the

scope of SD2 and stakeholder comments. AW/AMC reiterate these comments in this filing, such that the PSP will not address significant project impacts as identified by stakeholders and as identified in SD2 unless it is significantly revised. SD2, in addition to the PAD and scoping comments of AW/AMC and other stakeholders, provides the applicant with a more thorough understanding of project related impacts that must be studied.

SD2, in sections 3.0 and 4.0, adds clarity to the scope of the studies needed to inform the NEPA analysis. Specific to the AW/AMC interests, SD2 includes a number of issues related to the ecology, fishery, and recreational uses and impacts of project operations on Millinocket Stream and on the West Branch below Stone Dam. These river reaches and the dewatered bypass reach below the Ripogenus project and upstream of McKay Station are of interest to AW/AMC for these reasons and others and our specific comments are included herein.

II, General Comments on Proposed Study Plan

In summary, the PSP fails to meaningfully respond to and incorporate a vast majority of resource impacts identified by stakeholders in their PAD and scoping comments. For perspective, 35 studies were requested by stakeholders, of which the PSP rejects 21 of these proposed studies. The applicant wrongly suggests that by proposing no changes to project operations that existing impacts of the projects on related resources does not need analysis. In addition to the PSP rejecting a wide range of appropriately requested studies, the applicant has also proposed to delay the filing of information that is needed to inform the stakeholder and agency understanding of how the projects are operated and what specific resource impacts are related to project operations. The filing of 10 years of daily operations data should be provided immediately, and not delayed until the RSP is developed. Though AW/AMC welcome the addition of a Historic Operations Data and Assessment Study in the PSP, the data that is held by the applicant to inform this study should be filed and made available as soon as possible.

With a short window of time to review and comment on the RSP, AW/AMC implore the applicant to meaningfully revisit and update and PSP to include a much wider range of studies requested by stakeholders and to expand the scope of those studies proposed in the PSP to incorporate the impacts identified in SD2 and in stakeholder PAD and scoping comments.

3.6 Study to Evaluate the Effects of Operating the Penobscot Mills and Ripogenus Dams on the Hydrology of the West Branch and Mainstem Penobscot River Using an Indicators of Hydrologic Alteration Model

The licensee declined NMFS study request that it perform a Indicators of Hydrologic Alteration Model to evaluate project effects on aquatic resources. Contrary to the licensee's claim that the study is seeking to recreate pre-project conditions, this study is seeking to evaluate the effects of the licensee's current operations on fish species. The purpose of relicensing is to evaluate the extent of project effects on environmental resources under current and alternative modes of operation. FERC's baseline assumes existing project facilities, not existing operations. Comparing current operations to natural flow conditions through an IHA model will allow FERC to determine adverse project effects on fish species resulting from project operations. This study would inform FERC's NEPA analysis and license conditions that address minimum and naturally available flows in bypassed reaches, peaking operations, and other factors affecting environmental quality. Brookfield's rejection of this study is based on the recurring theme that since it is proposing no operational changes, study of environmental impacts of current operations is unwarranted. To the contrary, this study is necessary to inform FERC's NEPA analysis. Additionally, the licensee asserts that the study is unnecessary because it performed a different study on another project 50 miles away from the Ripogenus Dam at the Mattaceunk Hydroelectric Project. While this study may provide some useful information that will assist in the completion of the proposed study, the Mattaceunk study only analyzes the effect of existing operations and does not compare current operations to more naturally occurring flows as would be analyzed under the proposed study.

3.8 Study to Evaluate Future Flow and Water Temperature Scenarios

The licensee rejects NMFS study request that the licensee evaluate the effects of project operations from climate change over the course of a 30-50 year operating license, arguing that the effects of climate change are too speculative for study. The licensee is keenly aware of these effects, however, as numerous projects that it operates were forced to curtail operations in 2021 due to what it characterized as "extreme hydrological conditions". In rejecting the study, the licensee relies on the CEQ regulations promulgated by the prior administration that largely ignore the impacts of a changing climate on the federal decision-making process. On October 7, 2021, CEQ issued a Notice of Proposed Rulemaking that is expected to restore prior CEQ regulations and require an assessment of the impact of climate change as part of the NEPA analysis. We expect that new regulations will be promulgated during this relicensing. Additionally, FERC has expanded consideration of climate change in recent guidance. As such,

FERC should require this information requested in this proposed study to complete its analysis of project impacts and the applicant should conduct this study as requested by NMFS.

3.19 Controlled Flow Whitewater Boating and Access Study

Notwithstanding FERC's issuance of SD2 making clear that whitewater boating below project diversion dams, bypassed reaches, and powerhouses will be evaluated as part of its NEPA review of project impacts, the licensee rejected AW/AMC study request that it conduct a whitewater boating study in four river reaches: 1) Ripogenus natural river channel bypassed reach; 2) Below McKay Station powerhouse; 3) Stone Dam natural river bypassed reach; and, 4) Millinocket Stream.

In rejecting this study request, the licensee argues that sufficient information is known about whitewater boating in these river reaches based on prior evaluations and there have been no subsequent changes that require study. While FERC may rely on relevant and adequate ***existing*** studies, those studies need to be available to the licensing participants and based on an accepted and robust methodology. Thus far, the licensee has been unable to produce any prior whitewater boating studies and has referenced other anecdotal information. To the extent that the licensee intends to rely on existing studies, it must produce them for analysis along with the supporting data.

In rejecting the AW/AMC whitewater boating study request, the licensee references a 1990 Whitewater Rafting and Boating Survey that was conducted as part of a larger survey regarding "Recreational Activities in the Ripogenus Project." We are unable to evaluate the adequacy of this study and the licensee has thus far been unable to locate this study data. At best, this study would only inform flow preferences of the reach below McKay Station and provides no information on the Upper Gorge, Stone Dam, and Millinocket Stream whitewater boating reaches that are directly affected by project operations. The standard for conducting new studies is not whether there have been significant changes since the last relicensing as the licensee contends, it is whether a study is necessary to provide FERC with information necessary to complete its environmental review in order to inform the development of future license conditions.

In the prior relicensing FERC issued an Additional Information Request on June 8, 1992 addressing deficiencies in the prior licensee License Application. The requests specifically addressed minimum flow required for navigation by canoe below the Stone Dam or so-called "Back Channel" (AIR #2), whitewater flows below McKay Station (AIR #17 and AIR #18), minimum flow required for navigation by canoe on Millinocket Stream (AIR #22),

On December 7, 1992, the prior licensee responded to FERC's AIR[1]. In its response to AIR #2, the licensee responded to the AIR by stating, unsurprisingly, that the natural river channel below Stone Dam was not navigable based on leakage flows from the dam. The licensee did not conduct any type of controlled flow study into the bypassed reach to identify minimum acceptable or optimal boating flows much less a study following the *Whittaker* methodology. The licensee's response to AIR #22 estimated that canoes could navigate Millinocket Stream at flows above 250 cfs. The licensee's methodology for reaching that conclusion was based solely on isolated interviews with three canoeists who previously boated the reach. The licensee did not include copies of its survey instruments or responses. Neither the licensee's response to AIR #2 nor its response to AIR #22 involved an analysis of river hydrology or a qualitative assessment of the reach under various flows. Additionally, there have been significant changes in whitewater boating craft and skill since the last relicensing such that any conclusions are no longer relevant to FERC's current NEPA review though they do demonstrate that these stream reaches have recreational values that are currently impacted by project operations. No response was provided to AIR #17 and AIR #18 in this filing and the licensee's methodology for evaluating minimum acceptable and optimal flows was not provided. The current flows of 1800 - 2300 cfs at McKay Station also falls below the 2400 cfs identified in the AIR. It does not appear that the licensee provided any information in its application on the recreation potential of the Upper Gorge above McKay Station.

The licensee further stated in the PSP meeting that, in lieu of a controlled flow whitewater boating study using FERC approved methodology, whitewater boating information at the project could be found on Google or YouTube. We are unaware of any relicensings where FERC has accepted Google and YouTube as an acceptable methodology for assessing project impacts on whitewater boating. In scores of other relicensings, FERC has required licensees to follow the methodology as described in Whittaker et al., in "*Flows and Recreation: A guide to studies for river professionals"* (2005)[2]. In our experience, Google and YouTube searches lack scientific rigor and will not provide FERC with sufficient information to complete its NEPA review of project impacts.

The licensee does not dispute that the project operations affect whitewater boating opportunity in and below its project boundaries. At Ripogenus, the project diverts flows from the West Branch of the Penobscot River into penstocks and powerhouses, reducing flows in the Upper Gorge below the Ripogenus Dam to a trickle. Information from whitewater boaters utilizing this reach during spill or when McKay station is offline clearly demonstrate that this reach is boatable and is a valuable whitewater boating resource. While we have established the boating potential of this reach, we are unable to precisely identify or reasonably estimate the minimum acceptable and optimal flow necessary for a quality whitewater boating experience. Additionally, the

[1] FERC Accession number 19921208-0260
[2] http://npshistory.com/publications/rtca/nri/flows-recreation.pdf *(Accessed 2/4/2022)*

licensee has provided no data that would permit FERC to understand the frequency with which these flows would be available under natural hydrologic conditions. The purpose of relicensing is to evaluate alternative modes of operation under a future FERC license. In the case of Ripogenus, those alternatives would necessarily include an evaluation of minimum flows and naturally variable flows being spilled into the Upper Gorge to benefit aquatic habitat and recreation use. Measuring the extent of the licensee's impact on these resources is necessary for FERC to complete its environmental review, and existing information is insufficient. Providing this information will inform the development of future license conditions. We would anticipate that a Level 3 whitewater boating study would be required for this reach because limited information is known.

For the whitewater reach below McKay Station, there is significant existing information known and a more limited study may be more appropriate for this reach. Under the *Whittaker* methodology, a Level 1 study would include collecting existing information from users through an online survey, focus groups, and/or user intercept surveys to collect information on user flow preferences. In addition, the licensee should also perform a desktop analysis of project operations to determine whether alternative modes of operation would improve the recreational user experience. In the prior relicensing, FERC requested that the licensee provide information on a range of whitewater flows in AIR #17 and AIR #18, noting flow preferences of 2400-3600 cfs by whitewater boating outfitters. The current flow levels of 1800-2300 cfs, depending on water year, fall below this level, and it is unclear whether the current flow regime is sufficient. Completing a Level 1 study of this reach should be sufficient to answer this question.

For the reach below Stone Dam, the licensee has provided no information whatsoever about the whitewater boating potential of this river reach. This reach is periodically boated when flows on the West Branch exceed the hydraulic capacity of the project or when the powerhouse is offline causing the licensee to restore flows to the river. At other times, this river reach is dewatered except for leakage and no flow information is publicly available. Anecdotal reports from whitewater boaters demonstrate that this river reach has sufficient gradient and structure to provide a high quality whitewater boating experience when sufficient flow is provided; however, there is insufficient information to identify minimum acceptable and optimal flow ranges. Clearly the licensee's project operations have a direct impact on the recreational boating opportunity in this river reach. Study is required in order to quantify project impacts on this recreational resource. We would anticipate that a Level 3 study would be appropriate for this river reach and would include a desktop analysis, single flow evaluation, and a multiple flow on-water study.

For Millinocket Stream, we would similarly anticipate the need for a Level 3 study. In response to AIR #22 in the prior relicensing, the licensee acknowledges that this river reach would provide valuable whitewater boating opportunities if sufficient flow were provided. Select interviews

with three local boaters provided limited information about target flow ranges and estimated that flows in excess of 250 cfs would be required to navigate the reach by canoe and that flows in excess of 600 cfs would provide a more challenging whitewater experience. These interviews were conducted prior to the development of modern playboats, stand up paddleboards (SUP), river runners, and creek boats that substantially expanded the range of crafts and skill levels of whitewater paddlers. No controlled flow study was performed in the last relicensing that would sufficiently evaluate the potential of this reach under a range of flow conditions. The licensee's operations directly impact recreational opportunity as project facilities dam and divert flows into the North Twin impoundment for project generation. Understanding the effects of project operations on recreation resources would require a desktop analysis of flows using data in possession of the licensee and not available to the public. Additional information on existing use should be collected as part of the Level 1 stage. In Level 2, the licensee should provide demonstration flows to identify a target range of flows to be evaluated during the Level 3 on-water flow evaluation. The licensee should assemble a working group with recreation stakeholder groups including AW/AMC for each study reach to be evaluated during the whitewater boating study.

The licensee's overall response to the whitewater boating study request essentially boils down to its belief that there are plenty of whitewater boating opportunities below McKay Station or on other rivers in the region so there is no need to study whether there are additional boating opportunities in the Upper Gorge, Stone Dam, or Millinocket Stream. This argument, however, goes to the appropriateness of additional PM&E measures rather than the need for study to determine the extent of project impacts and the value of the resource. Equally important is that not all whitewater boating experiences are the same and each river reach has unique characteristics. Simply put, a Class V whitewater run utilized by rafting outfitters and expert whitewater kayakers is not equivalent to a Class II/III river reach below the Stone Dam or Millinocket Stream used by less experienced boaters, open canoes, and paddleboards. Without study, the licensee assumes that these river reaches have no recreational value beyond what is available below McKay Station, an assumption not supported by any currently available data.

While the licensee asserts that whitewater boating locally and nationally is in decline, the data does not support this assertion. Due in part to new technology and equipment as well as the COVID pandemic, the public has rediscovered the value of outdoor recreation and use numbers show that outdoor recreation is at record level with these trends expected to continue. A survey of whitewater boating outfitters and industry confirms the growth trend in whitewater boating, and we share with the Commission the following:

- Rafting with *North Country on the Penobscot* was up 30 percent last year even without the benefit of Canadian rafting passengers that typically account for 35 percent of its business.

- Outdoor New England (ONE) in Franklin, New Hampshire reported sales increase in their whitewater department as follows: 2019 +51%, 2020 +68%, 2021 +102%. Owner Marty Parichand also reported selling kayaks to 40+ states in 2021.
- Zoar Outdoors in Charlemont, Massachusetts reported sales increase in their whitewater department as follows: 2019-2020 42% increase, 2020-2021 42% increase
- Jackson Kayak in Tennessee, total boats ordered: 3181 (2019), 3225 (2020), 4572 (2021). Colin Kemp Director of Sales at Jackson Kayak stated: "Never before in my time in paddle sports have I seen all top-end manufactures in the US sold out to capacity. We basically sold the whole year's production for the last two years in a matter of weeks. That is a fraction of the time it used to take to book 80% capacity. Unlike some brands, we pushed harder on WW because it is our heart and soul, and with a combination of some really well-received designs like the Antix and new RS I could likely sell at least double what was booked if I had extra oven capacity or molds."
- Pyranha Kayaks, Tennessee: 2017 +3%, 2018 + 3%, 2019 + 3%, 2020 + 30%, 2021 + 71%, 2022 orders + 70%
- Mountain Man Outdoor Supply Company Old Forge, NY: Total sales. 2019 $2.1 million, 2021 $3.2 million dollars
- Astral PFD sales were at an all time high in 2021 and products have been continually sold out.
- Northwest River Supply (NRS) in Idaho reports that the number of whitewater kayaking participants in the United States is trending upward, not downward and is currently holding steady at about 2.6 million, up from about 1.7 million in 2011. That makes for 53% growth in participation over 10 years based on national trends.

3.20 Aesthetic Resources Study

The licensee declined AW/AMC study request that it evaluate project effects on aesthetics, both in the river corridor and on lands occupied by project works. In order to develop the best adapted plan for the river, FERC is required under the Electric Consumers Protection Act to give equal consideration to non-developmental resources including aesthetics. The PSP does not identify any existing studies or data that would allow FERC to evaluate project impacts on aesthetic resources.

The PSP mischaracterizes the AW/AMC study request in that its response is limited to the request to identify light and sound impacts. The study also asks the licensee to evaluate the following goals:

> (b) Determine if the projects have an adverse effect on a scenic vista, riverscape, or other noteworthy natural feature;

(c) Determine if the project degrades the existing character or quality of public views of the site and its surroundings;

Accordingly, this study will also involve an assessment of the aesthetic impacts of project operations on the Upper Gorge, Stone Dam, and Millinocket Stream locations at key observation points. To clarify and supplement our request, we would propose that the licensee follow the methodology described in Whittaker et al., "*Flows and Recreation: A guide to studies for river professionals"* (2005) to evaluate the adverse aesthetic impacts of the project on the natural landscape including the natural river reaches in the Upper Gorge, Stone Dam, and Millinocket Stream reaches. This evaluation should include the identification of key observation points where the public can view dams, geologic features such as Grand Falls, as well as other project works where a team consisting of stakeholders can evaluate the effect of flows and facilities on the aesthetic quality of the project and project works. Based on evaluation forms, the licensee should prepare a study report assessing project impacts.

While the licensee argues that an aesthetic assessment lacks a nexus to the project, project operations have an undeniable effect on the natural landscape. The licensee acknowledges that the Upper Gorge Trail is utilized by the public. Project operations divert flows from the Upper Gorge leaving only a fraction of the natural flows in this river reach. A study is needed to assess the extent to which project operations impact the public's use and enjoyment of this and other areas in the project boundary.

In arguing that the study request lacks a nexus to project effect, the licensee relies on the *Centralia* decision (*City of Centralia v FERC*, 213 F.3d 742, 749 (D.C. Cir., 2000)) to argue that the study is an attempt to search for a problem where there is no evidence that problem exists. The licensee's reliance on Centralia is misplaced. That case concerned a post-license study of the need for a tailrace barrier net where there was substantial evidence in the record that the barrier net was unneeded. There the court found that the project effects of the discharge on fish were entirely speculative. Similarly, in *City of Jackson, Ohio*, 105 F.E.R.C. ¶61,136 n.9 (2003), a FERC decision on which the licensee relies, likewise involved a post-license study to assess whether the project was having an adverse effect on fisheries resources. This decision is inapplicable to circumstances such as are present on the West Branch of the Penobscot where the effect of the project on a protected resource is clear and the study is designed to evaluate the extent of that impact so that FERC can complete its NEPA review based on its scoping document. *FPL Energy Maine Hydro, LLC*, 95 F.E.R.C. ¶61,106 n.15 (2001) and in *Allegheny Energy Supply Company, LLC*, 109 F.E.R.C. ¶61,028, 61,117 (2004), also cited by the licensee, likewise involved the need for a license condition requiring a post-license study of project effects on fish. Each of these cases are inappropriate.

The licensee endeavors to extend the holding in *Centralia* and subsequent FERC decisions citing that case to argue against requiring studies *during* the pre application phase of the Integrated Licensing Process (ILP) to limit the information available to FERC for its NEPA analysis. FERC's nexus requirement in its study criteria was not intended to create a barrier to study of project effects on resources that is within FERC's power to address in a license condition. In effect, the licensee's circular logic would require prior study in order to justify the need for a study while prior study makes the need for a study unnecessary. To meet FERC's nexus criteria, a proposed study need only show that the project has a direct or indirect effect on a non-developmental resource that will be evaluated by FERC as part of its environmental assessment. By this flawed logic, an aesthetic study would never be justified and a license condition requiring aesthetic mitigation would be deemed arbitrary and capricious because it lacked study. This Catch-22 scenario was certainly not what Congress intended when the Electric Consumers Protection Act amended the Federal Power Act to require that FERC "shall give equal consideration to the purposes of energy conservation, the protection, mitigation of damage to, and enhancement of, fish and wildlife (including related spawning grounds and habitat), the protection of recreational opportunities, and the preservation of other aspects of environmental quality." 16 U.S.C. § 797(e)

3.21 Socioeconomics Study

The licensee rejects the request by the Penobscot Indian Nation to conduct a study analyzing the current socioeconomic environment and future trends including employment and recreation economy in the project area. The licensee devotes the bulk of its Pre-application Document to arguing that the project should be relicensed under current license conditions because the project is not proposing any change to current operations and in the last relicensing FERC appropriately balanced resource needs. Pivotal to FERC's balance was its socioeconomic analysis of the impact of mitigation measures on economics and employment, namely the Great Northern Paper Mill in Millinocket. The Ripogenus and Penobscot Mill projects produced approximately 108 MW of power for the Great Northern mill. Due to the impact on power generation that would result from requiring the licensee to restore flows to the dewatered 4.5-mile section of the West Branch below the Stone Dam, FERC did not require any flow restoration to the so-called "Back Channel", eliminating recreation opportunity and continuing the destruction of aquatic habitat. FERC justified its decision based on reasoning that the loss of power would affect the competitiveness of the mill and result in lost jobs.

Notwithstanding FERC's decision to sacrifice environmental quality to the hope of protecting the paper mill from economic harm, the Mill closed in 2008. To the extent that the licensee continues to argue that FERC's 1996 license appropriately balanced developmental and non-power resources, that determination was based on the socioeconomics of the region at the time of relicensing. Today, those socioeconomic conditions are different in a region that relies on the

outdoor recreation economy rather than the paper mill for its economic well being. In rejecting the proposed study, Brookfield cannot argue that the prior relicensing appropriately balanced resources as conditions have dramatically changed since the last relicensing. By conducting the requested socioeconomic study, FERC will be better able to determine the appropriate balance based on current socioeconomic conditions.

Recreation Study Plan

2.0 Goals & Objectives

The licensee's proposed Recreation Study Plan fails to adequately address any of the goals identified by AW/AMC in its study request. The licensee seeks to limit the scope of its study plan to an assessment of only those sites identified as project approved recreation sites under its current license. Though SD2 indicates that FERC will include an assessment of the whitewater opportunities below Stone Dam and on Millinocket Stream, these areas would not be included in the applicant's recreation assessment as proposed. AW/AMC reiterate our request to more thoroughly conduct the recreation study to include the following components:

1. Obtain information about the condition of existing formal and informal recreation facilities and access to lands and waters from the top of the Ripogenus impoundment to the bottom of the East Millinocket tailrace including Millinocket Stream, project storage areas, and bypassed reaches; and existing recreation use, and demand at the project and non-project locations in this area;

2. Evaluate the adequacy of existing access to areas in and adjacent to project lands including impoundments and bypassed reaches in the project boundaries and on lands from the top of the Ripogenus impoundment to the bottom of the East Millinocket tailrace including Millinocket Stream, project storage areas, and bypassed reaches, including formal and informal access areas that are utilized for boating, angling, hiking, and other recreational use;

3. Conduct an assessment of the need to enhance recreation opportunities and access from the top of the Ripogenus impoundment to the bottom of the East Millinocket tailrace including Millinocket Stream, project storage areas, and bypassed reaches;

4. Quantify and map the relationship between reservoir surface area and reservoir levels, and how those reservoir elevations relate to recreation; and,

6. Inform the development of a Recreation Management Plan for the implementation of any enhancement measures and long-term monitoring of

recreation demand and adequacy of project and non-project facilities over the term of new licenses.

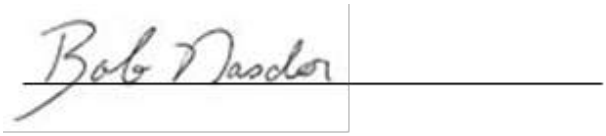
For both the Ripogenus and Penobscot Mills projects, the applicant proposes a Recreation Facility and Inventory Assessment study. Considering the complexities of the projects, impacts of the projects on more than 60 miles of the West Branch of the Penobscot River and its tributaries, as well as the nationally significant recreation resources in and adjacent to the project boundaries impacted by the projects, the scope of the applicant's proposed Recreation Facility Inventory and Condition Assessment is inadequate and must be significantly expanded.

In order to adequately assess project impacts on recreation resources, the licensee needs to evaluate both formal and informal recreational sites from the top of the Ripogenus impoundment to the bottom of the Penobscot Mills developments rather than limiting its assessment to only FERC-approved recreation sites in the project boundary as proposed in its study. These sites should include the Ripogenus Gorge, Stone Dam, and Millinocket Stream reaches as well as the reach between the Ripogenus and Penobscot Mills boundaries including all reservoirs and riverine reaches. Additionally, the study should include user intercept surveys at both formal and informal recreation sites as well as internet-based surveys, targeted interviews, and focus groups as appropriate.

Conclusion

American Whitewater and Appalachian Mountain Club respectively request that the Licensee revise its Proposed Study Plan to address these comments and concerns in order to provide FERC with sufficient information to conduct its NEPA analysis of project impacts.

Respectfully submitted this 18th day of February, 2022,



Bob Nasdor
Northeast Stewardship and Legal Director American Whitewater
65 Blueberry Hill Lane Sudbury, MA 01776
(617)-584-4566
bob@americanwhitewater.org



Mark Zakutansky
Director of Conservation Policy Engagement Appalachian Mountain Club
100 Illick's Mill Rd. Bethlehem, PA 18017
(610)-868-6915
mzakutansky@outdoors.org

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February 18, 2022

Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E. Washington, DC 20426

**RE: Comments on the Proposed Study Plans for Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458) from the Caribou and Chesuncook Lake Camp Owners Association and the Chesuncook Dam Camp Owners Association.**

Dear Secretary Bose:

I am submitting these comments on the Proposed Study Plan (PSP) for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) filed for Great Lakes Hydro America, LLC by Brookfield Renewable ("Brookfield") on behalf of the members of the Caribou and Chesuncook Lake Camp Owners Association and the Chesuncook Dam Camp Owners Association.

The two Associations represent over fifty camp owners with a significant and substantial interest in the relicensing of these projects. We have a deep love for and knowledge of, Caribou, Chesuncook, and Ripogenus Lakes, and have a large financial commitment to our properties. Many of our members have long multi-generational histories on the lakes and know them well before and after the current operator and applicant. It is our observation that Brookfield Renewable is operating Ripogenus Dam vastly differently than it was operated for its previous eighty-year history and now believe that numerous studies disregarded by the applicant are necessary for the health of the lakes as well as the recreational use of the lakes.

The 10 years of Operational Data requested by nearly all stakeholders is vital to the proceedings. Operational Data does not require a "study," as proposed by GLHA, it is simply providing data the licensee has. Data that will reveal the vast differences between operations 30 years ago and operations today. In the past application then dam operator, Great Northern Paper (GNP) stated "Since 1972 the maximum draw-down during the summer recreation period (between Memorial Day and Labor Day) has been 15.25 feet; the average has been 3.5 feet." Current operational data would clearly show the vast differences in operation. Operations that have profound impact on the wildlife and the entire ecology of the region, as well as significantly impacting property owners and recreational users of the lakes, rivers and project lands. This data is necessary to understanding and analyzing options in the new project operations.

Although GLHA proposes no modifications to current operations, and minimizes the need for numerous study requests, significant changes are necessary as the dam is operating vastly differently than it was 30 years ago and the socio/economic realities of the region have dramatically changed. Thirty years ago, energy from the dam was used to power a mill that was one of the largest employers in the region and even the state. This economic concern was the

driving force behind the UAA conceived at the time. A UAA that would not be issued if sought at this time, and is in dire need of reevaluation. The employer is now gone, tourism is a major economic factor in the region, and the power from the dam is used for profit. This profit cannot come at the expense of the lakes and river, the animals who live on/in it, recreational users of the area, and the property owners surrounding the project area.

In order to properly analyze the impact of the different operating procedures requested studies are needed. At the Proposed Study Plan (PSP) meeting GLHA presented, in a very polished manner, how well the operations are working and why the studies from 30+ years ago are still valid. Unfortunately, their presentation lacked substance about the lake and did not address the current realities. The lake-level and project operations are clearly different and it is absurd, insulting and untrue to claim differently. Operational data will prove this. We do not claim to be scientists, but many of us spend a large portion of the year on the lake and we can provide relevant, anecdotal data to support the requested studies.

The Freshwater Mussel study requested by the USFWS is an example of a necessary study that needs current data to inform decisions. Dead mussels, including potentially endangered species, litter the shoreline on the dramatically expanded littoral zone as a result of lake drawdowns much greater than claimed by GLHA. The remnant mussel shells leave a feast for gulls. Similarly, the Common Loon Management Plan Assessment and the Common Loon Productivity Assessment are studies GLHA discarded with claims about the success of the current management plan, which has not been updated in 10+ years. Evidence from numerous locations on the shoreline and lake reveal loon platforms high and dry, seemingly ineffective and apparently not maintained for many years. If project operations, and hence water levels, are dramatically different than in the past logic indicates the resulting impact will also be different.

The impact on camp owners and other recreational users has also been profound, necessitating a Recreation study. Camp owners on Caribou and Ripogenus lakes are unable to access Chesuncook Lake at low water, inhibiting their ability to fish, boat and recreate on all impoundment waterways. Many camp owners are unable to get water from the lake without extensive water systems or carrying large buckets of water over rocky shores. Campers and visitors to the area must do the same in mid to late summer as many campsites are long distances from the water. Docks and moorings quickly become unusable with constant drawdowns. Boats parked at the water’s edge must be moved every couple days to prevent them from being left high and dry. Access to lakes via the Chesuncook and Caribou Lakes boat landings also inhibits recreational access. The boat landings have become unusable during the recreational season for the past two summers. Even at the smaller drawdowns of early spring the boat landings are mere rocky paths to the water. In 1990, the Maine Department of Conservation stated “the limited development in the project area; the extensive, high-quality natural resources; the existing recreational facilities; and the amount of public use of the river make the Ripogenus Project area one of the most important recreational areas in Maine.” This highly valued area deserves studies to determine operational impact. GLHA has included a modified version of a Recreational study. It is vital this study includes camp owners as well as other summer and winter recreationists.

An Aesthetic study, not adopted by GLHA, is necessary to analyze the impact of severe lake drawdowns on the aesthetics of one of the greatest recreation areas in the country. As numerous pictures reveal, the aesthetic quality of the area is greatly diminished with unlimited lake drawdowns. Large rocks become exposed and walking is nearly impossible. As one visitor stated, the area becomes a moonscape.

We greatly appreciate how thoroughly the Commission identified stakeholder concerns and correspondingly modified the Scoping Document 2 (SD2) and the commitment to addressing listed environmental issues in the NEPA document. Unfortunately, GLHA's study plans are inadequate to meet the expectations of the SD 2. Essential studies are necessary to ensure all components of the SD 2 are met. We fully support all federal, state and NGO study requests. Additionally, we recognize the rapidly changing climate may necessitate future modeling, and a fluid, flexible permit that responds to changing climate realities. We ask the Commission to ensure **current** and relevant data is collected that will give us all the necessary information to mold a new, balanced permit that addresses the needs of the operator, the fish and wildlife, the lake and river ecology, and the people who so greatly value this unique and precious resource.

Respectfully,

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947
bhoustonps@gmail.com

Michael J Smith, Millinocket, ME.
To whom it may concern:

I am a resident of Millinocket, ME and an avid user of the various reaches within the West Branch watershed. I am writing to share my enthusiastic support for flow studies that will help evaluate recreational opportunities and the ecological well-being of the Ripogenus Dryway, the West Branch below Stone Dam, and Millinocket Stream. These waterways are of profound importance to our local communities and the future of our region.

I also work with several community organizations within the Katahdin Region that rely on the West Branch and Millinocket Stream for recreational and educational programming. Millinocket Stream, in particular, with its proximity to residential neighborhoods, community green spaces, trails, local businesses, and community resources, is of profound importance to those of us that live here. Flow studies here and on the other reaches in question are critical in helping us understand how to best manage these waterways for future generations.

Thank you for your time and consideration.

Best,
Mike Smith

Sharon Klein, Orono, ME.
Kimberly D. Bose, Secretary
February 18th, 2022
Federal Energy Regulatory Commission
888 First Street, NE,
Washington, D.C. 20426

RE: Penobscot Mills (P-2458-247) and Ripogenus (P- 2572-133) Proposed Study Plan

Dear Secretary Bose,

I have reviewed the Proposed Study Plan (PSP) for the Ripogenus Hydroelectric Project (FERC NO. 2572) and the Penobscot Mills Hydroelectric Project (FERC NO. 2458), drafted by Great Lakes Hydro America, LLC (licensee) on November 22, 2021. I have also reviewed the comments submitted by the Penobscot Indian Nation (PIN) on February 18, 2022 and October 12, 2021. I support the PIN's request for an updated socio-economic study.

The current state of the economy in Maine and in the specific region where the dams reside has changed much since the previous licensing event. In addition, our understanding of how marginalized groups (e.g., Black, indigenous, and other people of color, rural, low-income) have borne proportionally more costs of energy production compared to other groups has increased. The literature and practical decision-making related to energy equity and justice have changed drastically in the last decade alone. As a researcher and educator who focuses her work on understanding trade-offs in energy decisions that have multiple positive and negative economic, environmental, and social implications, I recommend a new socio-economic study be conducted for the dams involved in these two relicensing events.

I recommend at a minimum the study replicate what was done in the previous relicensing but with updated input data and calculations. However, a more engaged study would more accurately capture the socio-economic state of being during this time period and lead to more robust results for all parties involved. I recommend the study start with a working group that engages all members of the communities affected (in positive, negative, and neutral ways) by the dams in multiple dialogues to identify the socio-economic indicators that are important to their livelihoods and lifeways. I recommend experts in socio-economic research (i.e., myself, my colleagues at the University of Maine, and/or others) be engaged in the working group to help identify appropriate methodologies for measuring the indicators identified by the working group.

Once indicators are identified, data collected, and the appropriate methodologies implemented for each indicator, a quantitative integrative tool like social benefit cost analysis or multi-criteria decision analysis can be used to identify a total value and/or ranking for various decision points using the new socio-economic data and results. This type of integrative analysis could be conducted in close collaboration with the broader NEPA analysis.

In this time of transition from fossil fuels to renewable energy and enhanced focus on energy equity and justice, it is advisable in such a crucial decision juncture as relicensing to take the time to make sure we are working with the most up-dated data, analysis, and options in the broader decision space.

Sincerely,

Dr. Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono, ME
207-581-3174
sharon.klein@maine.edu

Benjamin Koehler, Orono, ME.
FERC's issuance of SD2 making clear that whitewater boating below project diversion dams, bypassed reaches, and powerhouses will be evaluated as part of its NEPA review of project impacts, the licensee rejected AW/AMC study request that it conduct a whitewater boating study in four river reaches: 1) Ripogenus natural river channel bypassed reach; 2) Below McKay Station powerhouse; 3) Stone Dam natural river bypassed reach; and, 4) Millinocket Stream. In rejecting this study request, the licensee argues that sufficient information is known about whitewater boating in these river reaches based on prior evaluations and there have been no subsequent changes that require study. While FERC may rely on relevant and adequate existingstudies, those studies need to be available to the licensing participants and based on an accepted and robust methodology. Thus far, the licensee has been unable to produce any prior whitewater boating studies and has referenced other anecdotal information. To the extent that the licensee intends to rely on existing studies, it must produce them for analysis along with the supportin data.

In rejecting the AW/AMC whitewater boating study request, the licensee references a 1990 Whitewater Rafting and Boating Survey that was conducted as part of a larger survey regarding "Recreational Activities in the Ripogenus Project." We are unable to evaluate the adequacy of this study and the licensee has thus far been unable to locate this study data. At best, this study would only inform flow preferences of the reach below McKay Station and provides no information on the Upper Gorge, Stone Dam, and Millinocket Stream whitewater boating reaches that are directly affected by project operations. The standard for conducting new studies is not whether there have been significant changes since the last relicensing as the licensee contends, it is whether a study is necessary to provide FERC with information necessary to complete its environmental review in order to inform the development of future license conditions.

In the prior relicensing FERC issued an Additional Information Request on June 8, 1992 addressing deficiencies in the prior licensee License Application. The requests specifically addressed minimum flow required for navigation by canoe below the Stone Dam or so-called "Back Channel" (AIR #2), whitewater flows below McKay Station (AIR #17 and AIR #18), minimum flow required for navigation by canoe on Millinocket Stream (AIR #22), On December 7, 1992, the prior licensee responded to FERC's AIR1. In its response to AIR #2, the licensee responded to the AIR by stating, unsurprisingly, that the natural river channel below Stone Dam was not navigable based on leakage flows from the dam. The licensee did not conduct any type of controlled flow study into the bypassed reach to identify minimum acceptable or optimal boating flows much less a study following the Whittaker methodology.

The licensee's response to AIR #22 estimated that canoes could navigate Millinocket Stream at flows above 250 cfs. The licensee's methodology for reaching that conclusion was based solely on isolated interviews with three canoeists who previously boated the reach. The licensee did not include copies of its survey instruments or responses. Neither the licensee's response to AIR #2 nor its response to AIR #22 involved an analysis of river hydrology or a qualitative

assessment of the reach under various flows. Additionally, there have been significant changes in whitewater boating craft and skill since the last relicensing such that any conclusions are no longer relevant to FERC's current NEPA review though they do demonstrate that these stream reaches have recreational values that are currently impacted by project operations. No response was provided to AIR #17 and AIR #18 in this filing and the licensee's methodology for evaluating minimum acceptable and optimal flows was not provided. The current flows of 1800 - 2300 cfs at McKay Station also falls below the 2400 cfs identified in the AIR. It does not appear that the licensee provided any information in its application on the recreation potential of the Upper Gorge above McKay Station.

The licensee further stated in the PSP meeting that, in lieu of a controlled flow whitewater boating study using FERC approved methodology, whitewater boating information at the project could be found on Google or YouTube. We are unaware of any relicensings where FERC has accepted Google and YouTube as an acceptable methodology for assessing project impacts on whitewater boating. In scores of other relicensings, FERC has required licensees to follow the methodology as described in Whittaker et al., in "Flows and Recreation: A guide to studies for river professionals" (2005)2. In our experience, Google and YouTube searches lack scientific rigor and will not provide FERC with sufficient information to complete its NEPA review of project impacts.

The licensee does not dispute that the project operations affect whitewater boating opportunity in and below its project boundaries. At Ripogenus, the project diverts flows from the West Branch of the Penobscot River into penstocks and powerhouses, reducing flows in the Upper Gorge below the Ripogenus Dam to a trickle. Information from whitewater boaters utilizing this reach during spill or when McKay station is offline clearly demonstrate that this reach is boatable and is a valuable whitewater boating resource. While we have established the boating potential of this reach, we are unable to precisely identify or reasonably estimate the minimum acceptable and optimal flow necessary for a quality whitewater boating experience.

Christopher Howe, kingfield, ME.
My name is Christopher Howe I am the river manager for North Country Rivers on the Penobscot. I have worked on the Penobscot since 2009
and the last 2 seasons have been the busiest I have ever seen. Pre-Pandemic, we had an average 4-5 full time staff, and this year I have
8 full time staff lined up to work in 2022. The future of whitewater is very bright in America and the value of this sport to youth and adults
alike cannot be over-stated.

Millinocket has seen hard times since Great Northern shuttered the mill in the early 2000s. Tourism has played a huge role in helping
fill the economic void that has plagued the town since the mill shut down. Millinocket and the Katahdin Region would only benefit from
expanding high quality whitewater recreational opportunities on nearby rivers.

Brookfield and Great Lakes Hydro rejected requests for flow studies to properly assess and catalog whitewater boating opportunities below
Millinocket Lake Dam, Ripogenus Dam, and Stone Dam. This re-licensing project has an unprecedented opportunity to highlight the quality whitewater affected by GLH projects, during a time of exponential growth in whitewater paddle sports. For these resources and opportunities to go unstudied
for another 35 years would be an extreme disservice to Millinocket, the Katahdin Region, and its future potential. If recreational flows
were given in these river reaches, in addition to what we already have below McKay Station, an individual could progress from a complete novice to an expert whitewater
paddler with only having to drive 30 minutes from Millinocket.

There is no official data documenting whitewater boating between Ripogenus Dam and McKay Hydro station. GLH and Brookfield egregiously state that this is a unnavigable
and dangerous stretch of river, while gigabits of video and photo content exists on the internet proving that it is the opposite. A weekend of scheduled releases on this stretch of river could be the center piece of a paddling festival that could draw hundreds of paddlers to our remote corner of Maine.

There are also no official data documenting paddling opportunities between Millinocket Lake Dam and the Town of Millinocket. This stretch of river is perhaps in my view the most important section of river under review in this process. Millinocket Stream has huge potential to act as a gateway into a positive and healthy hobby for youth and residents of Millinocket. Currently local schools and youth programs are able to utilize Millinocket Stream in a limited capacity to introduce youth to paddling. If This river stretch has more consistent boatable flows this will only increase opportunity for local youth to have something fun and exciting outside of their tablets and phones. The nature of the whitewater on this stream is absolutely perfect for the novice paddler. Its opportunities are the most diverse of all stretches considered in this re-licensing offering recreation for paddleboards, Canoes, and Kayaks.

As a taxpayer, a citizen of Maine, and the United States. It is my belief that it is the duty of the Federal Energy Regulatory Commission to ensure that GLH adequately studies and documents all recreational boating opportunities before any policies, stipulations, and requirements are set in stone for an operating license that will last past the retirement or death of all parties involved in the process. We owe it to our future generations to fully understand the potential of the recreational value of these sights before they are shelved and forgotten about for the next 35 years.

Susan Adams, Patten, ME.
I am writing to share my enthusiastic support for flow studies that will help evaluate recreational opportunities and the ecological well-being of the Ripogenus Dryway, the West Branch below Stone Dam, and Millinocket Stream. These waterways are of profound importance to our local communities and the future of our region. We raised our son and spent 1/3 of our lives along the West Branch and are very interested in its well being and protection for future generations. Thank you
Susan Adams

Ms. Kimberly D. Bose
February 21, 2022
Secretary,
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426.

VIA Electronic Filing

**Reference: Ripogenus Hydroelectric Project (P-2572-133)**

**RE; West Branch of the Penobscot River below McKay Station, the need to Study and Develop Habitat Based Minimum Flows and the failure to provide flows into the Holbrook Bypass Channel (Article 406 of the WQC)**

Lake level and flow management of the Ripogenus and the North Twin Projects are vastly different from operations described in the 1996 EIS. The Licensee, an international company, is selling a Maine resource (electricity) to a foreign country, New Brunswick, CA. Long gone are any local public benefits. The use of water storage and flow and the need for power have changed since the 1996 FERC License. Great Northern Paper (GNP) Mills are gone and with the mill closure the need to protect the recreational based local economy is more important than ever. Angling, boating, tourism, snowmobiling, etc., are all important within the project areas. A number of studies are needed including the need to develop a West Branch of the Penobscot River (West Branch) operating minimum or environmental flow (sometimes referred to as habitat based flow) below McKay Station. The present use of a minimum Aquatic Based flow or any generic flow prescription, that is not based on habitat; depth, substrate, flow, velocity, and species life stage is archaic and inappropriate and thus unacceptable.

In the good old days (circa 1900-2005) the mill operator used hydropower for baseload operations. A minimum of 2000 cubic feet/sec (cfs) was established by the legislature as part of the original charter granted to the mill developer at the turn of the twentieth century. That flow was established for the West Branch at Millinocket (P-2458) as the minimum flow. The 1992-1996 FERC licensing process established a minimum flow at the upstream McKay Station facility with the understanding that this flow was primarily for periods when the Millinocket and East Millinocket mills needed to be shut down. In fact, selling West Branch power into the grid was by and large not an option because the tie-line to the grid was weak. Now the mills are gone and the Licensee, a major player in National energy markets calls the shots. There is no local manufacturing baseload need to drive the conservation of water to assure paper can be made 24/7/365. The value of waterpower on the open market drives the use of water

storage. A dollar made today from selling the water is worth more than the uncertain value of the selling later in the year. The fish, bugs, loons and other flora and fauna get what the market dictates. A fundamental rebalancing of basic 21st century environmental requirements vs 19th century robber-baron mentality is called for.

Regarding the West Branch below McKay Station the 1996 EIS states “fishing quality is high at 0.41 fish per day. The average size is 18.2” and 2.2 pounds” (EIS 3-37). The existing fishery is now concentrated in the 1.25 miles below McKay Station (communications with WB anglers). An eighteen inch salmon is now a trophy (personal communications and observation) rather than the historic norm. The EIS states the West Branch below McKay Station is a unique fishery. This is not the current situation, fisheries and aquatic communities need to be returned to 1980’s and 1990’s levels described in the EIS and the accompanying 401 Water Quality Certification and deserve full protection. Lake level and river flow (minimum flow, ramping) management are the primary component of needed studies.

The change to peaking power and the resulting Lake level management (or lack thereof) have impacted fish, aquatic invertrabrates, plankton and fishing opportunity. Landlocked Atlantic salmon (salmon) and rainbow smelt populations in the Ripogenus Impoundment waters (five basins and the West Branch) are in a death spiral (DIFW 10/8/2021 filing). In the West Branch, aquatic insects e.g., Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies) are fewer. Konrad et al (2008) reported alteration to macro invertrabrate communities, including lost taxa, resulting from changes in timing, magnitude and duration of flow. Armanini et al. described the impacts of Magpie River hydropeaking (a Brookfield project) on macro invertrabrates and the benefits of ramping. In order to prevent further degradation of fish and aquatic communities, and interim environmental flow needs to implemented and a habitat based operating flow needs to be developed and become a condition of any new license issued by FERC.

A major impact on the fish and aquatic communities is the licensee’s inappropriate and continued use of the licensed minimum flow below McKay Station as a diel parameter. Such operations stress the aquatic communities. Late this summer the licensee reduced peaking flows in the early evenings to the licensed minimum. The licensee controls storage and flow and if it so chooses, can refer to Water Management Plan and rule curve (storage over time) for long term planning. Around mid-May, 2021 there was approximately 33 billion cubic feet (bcf) available in storage (25 bcf in the Ripogenus Impoundment, 8 bcf in the upstream Storage Project (P-2624)) and another 6 BCF in inflow though September 15. There are many PM&E measures that could have been supported with 39 BCF. However, the licensee deliberately continued daytime peaking operation while using the project’s licensed minimum of 1000 cfs during the night to slow the impact of rapidly declining impoundment

storage. This element of McKay Station 2021 operations drained the Ripogenus Impoundment and eliminated critical lacustrine e.g., littoral zone(s) and riverine habitats e.g., dewatering of the Holbrook bypass channel (WQC Art 406), and frequent dewatering the shoreline and microhabitats, **Troelstrup** et al. (1990) below McKay Station. This policy needs to be enforced.

The deliberate dewatering of the Holbrook bypass channel, a license condition (401 CWA, Article 406), is alarming. This condition, a PM&E measure, was designed to mitigate for the lack of salmon nursey (fry) habitat in the West Branch. The 1996 EIS (4-19) estimated that the Holbrook bypass (Article 406) would contribute 235 three year old adult salmon or approximates 550 adult fish to the West Branch salmon population as this age class is carried though it's age III to age VI cycle. The loss of this year class accompanied by similar loses of fry and parr in other very limited nursey areas and further degrades the salmon fishery. July though mid September storage and flow levels were entirely under the licensee's control. Low flow periods e.g. 1000 cfs, during August and early September nights were entirely preventable**. Holbrook low flows continue today, it is unlikely that there will be any bypass channel salmon spawning/incubation success this winter (2021-2022) as any November egg deposition will be subject to extreme freezing, another salmon year class and the accompanying 550 adult production will be lost. These low flow events not only violated a license condition (article 406) but also violated Maines's Anti-degradation policy. FERC needs to act on this violation.**

**It also should be noted that the current 1000 cfs spawning and incubation flow that was initiated in October, before the salmon spawning season, is not empirically based. I surveyed West Branch spawning areas for fifteen years, there is no evidence that the quality, quantity and location of spawning habitat available at current flows (1000 cfs) will meet reproductive goals. The assumption that favorable (gravels, velocity, interstitial flows) conditions can be transformed upstream, downstream or latterly has not been proved. Salmon spawning and spawning success requires physical conditions, substrate, depth and accelerating flows, described in Volume VIII of the license application and in the EIS, and eggs are vulnerable to freezing during winter months and siltation in the spring resulting from higher snow melt flows. The West Branch salmon population shouldn't be a victim of poor water management, the lack of spawning success and subsequent juvenile habitat reductions puts future salmon age classes in jeopardy. Another PM&E lost**.

From the licensee's PAD/NOI filings and presentations it appears that the licensee will continue to use minimum flow operations as needed e.g., when energy demands are low. The use of the license minimum flow is inappropriate and not the intended use of the West Branch minimum flow set by the agencies, NGOs and GNP in 1992. At that time, GNP mills were producing paper 24 hours a day and the only issue was the short-term protection of salmon (aquatic communities were not directly considered). How the final licensed 1996

minimum flow was derived is confusing. Initially the minimum flow recommended by the agencies was 1455 CFS then 1300 CFS and finally the current 1000 CFS which was derived from an Aquatic Based Flow (ABF) formulae but also met optimal McKay Station turbine efficiency. In any event, daily low flows of 1000-1455 CFS do not provide the habitat protection necessary to support the world-class West Branch salmon fishery and aquatic communities. There is an obvious and immediate need to correct minimum flows requirements and the rate of change (ramping) of West Branch flows below McKay Station. The need for ramping applies to all the licensee's tailwater reaches.

The Licensee' use of (any) ABF minimum flow is simply not appropriate. The U.S. Fish and Wildlife Service added this declaimer in its 1981 ABF policy insurance;

*U.S. Fish and Wildlife Service (1981) developed a "New England Aquatic Base Flow Policy" (ABF). The policy recommended use of the August median streamflow as the minimum streamflow for summertime maintenance of habitat for biota. This minimum streamflow was selected because "low-flow conditions occurring in August typically result in the most metabolic stress to aquatic organisms due to high water temperatures and diminished living space, dissolved oxygen, and food supply"*

The use of any generic minimum flow standard e.g., Tennent, ABF, Montana, 7Q10, etc., as an operational minimum for the West Branch below McKay Station is inappropriate. It uses flow guidance, ABF in this case, for an unintended purpose. Aquatic biota is not directly considered in hydrological "desktop methods". ABF flow methods (flow prescriptions vary with month) use only mean flows and were developed in rivers/streams NOT inhabited by adult landlocked salmon and Hydropsychidae caddis. Thus, the assumption that since these (low) flow conditions (usually August) existed naturally and fish species survived, then similar low flows would provide protection is incorrect. Protection of West Branch ecosystems, in the unlikely event any protection exists at 1000 cfs, is not enhancement. Only Tennant (1976) seemed to recognized the need to define various levels of protection; 10% of mean annual flow (MAD) for minimum protection, 30% MAD for moderate protection and 60% MAD for quality protection. The current West Branch minimum flow (no matter how it was derived) does not provide the high level of protection needed for the world class salmon fishery and aquatic communities downriver of McKay Station. The habitat of this reach is high gradient. It is mostly a narrow channel filled with rock, boulder and ledge substrates, any minimum/environmental flow prescriptions need to be habitat based.

The USFWS Aquatic Base Flow Policy was specifically established as "Many applicants either do not need or do not have sufficient time or resources to conduct a site-specific instream flow study". This is certainly not the case here; Brookfield (the licensee) is a multi-billion dollar international corporation with

vast resources to conduct a proper, field based instream flow study of the West Branch. Furthermore, the USFWS ABF Policy also states: "Site-specific studies such as the Instream Flow Incremental Method may be appropriate when: complex negotiation processes are involved; the project itself is complex; the waters are allocated or over-allocated; several flow alternatives need to be considered and compared against one or more baselines; complex administrative proceedings are involved; and time and costs are not major constraints." This exactly describes the current relicensing of the Ripogenus and Penobscot Mills Projects.

In order for FERC to conduct an adequate assessment of habitat vs flow in the West Branch of the Penobscot River as part of their NEPA analysis, transects must be established from McKay Station downstream to its confluence with Ambajesus Lake and then from North Twin Dam downstream to the confluence of the East and West Branches of the Penobscot River. Data including substrate, depth, and velocity must be collected over a range of flows to allow habitat vs discharge relationships to be established for various salmon and macro invertrabrate life stages. Absent these data, the Commission will not be able to conduct a thorough NEPA analysis.

Ahmadi-Nedushan, Behrouz, et al. (2006) described factors needed to determine suitable flow regimes. "*Physical habitat structure is of paramount importance in determining both the abundance and species composition of stream fishes (e.g. Allan, 1995; Bovee et al., 1998; Peeters and Gardeniers, 1998; Vadas and Orth, 2001). The most important physical habitat variables include water depth (e.g. Geist et al., 2000; Guay et al., 2000; Beecher et al., 2002; Kynard et al., 2000), water velocity and flow (e.g. Geist et al., 2000; Kynard et al., 2000; Mallet et al., 2000; Peeters and Gardeniers, 1998), cover (e.g. Vadas and Orth, 2001) and substratum composition (e.g. Knapp and Preisler, 1999; Vadas and Orth, 2001). Water velocity and the associated physical forces collectively represent the most important environmental factors affecting the organisms of running waters.".* ABF methods are based on median flows across a given geographical region. Depth and velocity are not part of the equation nor are any of the other critical parameters listed above

The science of flow, habitat and their relationship to aquatic species has changed since 1992 The magnitude and timing of flow change and its relationship to base flow is now part of the equation. Hunter M.A. (1992) reported that a slight flow change of one to two inches an hour was needed to support juvenile salmon West Coast salmon.. Relationships between habitat based minimum and peaking flows have been reported in the literature. These authors evaluated minimum flows and peaking. The general conclusion was that higher minimum/environmental flows at the starting point provided greater protection from peaking events. Bain et al. (1988) reported that high frequencies of flow change reduced both the abundance and number of species. Irving et al. (2014) reported that stranding was reduced when the magnitude of

flow change was lessened and noted that channel configuration and season influenced (pacific coast) salmonid behavior. Greimel et al. (2018) suggested high base flows would reduce the impact of peaking. Travnichek et al (1995) found that an increased minimum flow mitigated, to some degree, the impact of peaking on Tallapoosa River fish populations. Bunn & Arthington, (2002) reported that magnitude, frequency, and timing of flow change determined aquatic impacts and Poff et al. (1997) added rate of change to likely impacts. McKinney **et al (2001) studied rainbow trout populations (stocked and wild fish) in the Colorado River below Glen Canyon Dam. Trout populations responded positively to an increased minimum flow and reduced daily flow fluctuation. Growth and abundance of wild trout improved following the 1991 modification of the flow regime.** Behrouz et al. (2006) provides a detail examination of modeling used in determining flow management options.

**The above paragraphs describe continuing Ripogenus Project impacts resulting from present project operations and the need for immediate action. The structure of fish and aquatic communities described in the EIS was based on an operating minimum of a "two wheel" (turbine) operation. This flow was based on turbine efficiency (maximum McKay Station turbine efficiency was 92-96 % of flow capacity) and resulted in a base flow of 2200-2400 cfs. As an interim measure, FERC should require an operating minimum flow of 2300 cfs beginning at the end of the 2022 snow melt. I thank FERC in advance for considering my recommendations for returning project waters to 1980s and 1990s levels needed to support the world class salmon fishery and healthy aquatic communities. The fish, bugs and anglers need FERC's help**.

Ed Spear

307 Mt Hope Ave.
Bangor, Me 04401
Phone: 207-217-4288
Email: edspear1@yahoo. Com

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February 21, 2022

Ms. Kimberly D. Bose
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

TROUT UNLIMITED
MAINE COUNCIL

**Via online submission to: http://www/ferc.gov (cross-filed)**

Subject: **Comments of Maine Council of Trout Unlimited on the Proposed Study Plan for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458)**

Dear Secretary Bose:

On behalf of its six chapters and over 2,000 members, Maine Council of Trout Unlimited (TU) submits these comments on the Proposed Study Plan (PSP) for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) filed for Great Lakes Hydro America, LLC by Brookfield Renewable ("Brookfield" or "Applicant") dated November 22, 2021.

**General Comments**

The Applicant began the PAD stating that the full suite of studies is not needed.[1] It has gone on to review the 35 study requests submitted by organizations and only proposed conducting 3 without modification, accepted 13 more with modification or included them with other studies, and rejected 19 outright. The Applicant calls the proposed studies a "determination."[2] The study plan determination is a FERC function, not one made by the applicant. The applicant continues to propose acceptance of predominantly 30-to-40-year-old studies. This is confusing and delaying effective progress through the ILP relicensing process.

TU combined with Appalachian Mountain Club ("AMC"), American Whitewater ("AW"), Caribou, Chesuncook Lake Camp Owners Association, Chesuncook Dam Camp Owners Association, the Allagash Gateway Campground, and Andre Emerson Cushing Corporation to submit joint preliminary PSP Comments that addressed our underlying concerns regarding the current status and direction of the relicensings.[3] Please consider the contents of that filing when reading and evaluating the merits of this one.

[1] Brookfield Notices of Intent and Pre-application Documents for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) dated June 11, 2021, page 1-11. "*GLHA maintains that a full suite of new studies is not needed, that the vast body of information on which today's certifications and licenses are soundly based and should be relied upon for these relicensings. In addition, consistent with the Commission's criteria for study requests, the scope and extent of any new study be focused on addressing specific data gaps necessary to inform the development of license requirements.*"
[2] PSP, page 1-19, Table 1-1 title: "*Stakeholder Study Requests for the Ripogenus and Penobscot Mills Project and GLHA's Determination.*"
[3] TU filing of February 10, 2022, Accession number 20220210-5189.

**Maine TU Council Study Requests:**

**Ripogenus Flow Excursion Study.** TU's PAD Comments[4] requested a study to document the stability of flows from Ripogenus Dam as they compare to the licensed project minimums and to conduct a 400 cfs flow demonstration to determine the impacts of "generator outage flow" on aquatic organisms.

Brookfield rejected the study request explaining that their Historical Operations Data and Assessment Study would document any such deviations from project minimums;[5] **Brookfield ignored the included request to conduct a 400 cfs flow demonstration to evaluate the impacts of these flow levels.**

Brookfield is well aware of this type of study: one was conducted a few years ago in concert with the Penobscot Project, P-4784. Additionally, as Maine TU Council stated in its PAD Comments[6] Brookfield itself had made preparations for demonstration of the effects of flows below licensed minimums for its Wyman Project, P-2329 for the summer of 2021 but never conducted the event.

The effects of 400 cfs below McKay Station on aquatic organisms is currently not known. Projects operations could mitigate the effects of such events if they are truly unavoidable or uncorrectable using technology available. An obvious example would be to continuously release some water through a deep gate lessening the impact of flow reduction to 400 cfs through the turbines. Deep gate releases have been used successfully in the past to maintain flows at Ripogenus Dam.[7]

The following provides the FERC Study Request for a Stranding Evaluation Study.

## Stranding Evaluation Study

***Goals and Objectives***

The study will provide information regarding the potential for fish stranding associated with the Ripogenus Project. The study objective is to determine the extent and degree of danger stranding pools that occur from below the McKay Station discharge to Nesowadnehunk Falls, especially under 400 cfs generator trip events.

***Known Resource Management Goals*** (Under §5.9(b)(3) If the requester is a not a source agency, explain any relevant public Interest.)

The requestor, Maine Council of TU, is a non-governmental organization (NGO).

Maine's rivers, great ponds and wildlife are, by law, public resources. The West Branch of the Penobscot is one of the areas in Maine that TU members most prefer for fishing and other recreational activities, and thus TU has a direct interest in the waters affected by project operations, especially those from Ripogenus Dam to below Nesowadnehunk Falls.

[4] Maine Council of Trout Unlimited letter dated October 9, 2021, Subject: Comments of Maine Council of Trout Unlimited on the Notices of Intent and Pre-application Documents for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458)

[5] PSP, Part 1, page 3-14.

[6] TU PAD Comments dated October 9, 2021, page 19.

[7] Brookfield Letter dated August 24, 2015, page 2.

***Background and Existing Information***

There is no existing information regarding stranding-prone areas or operational scenarios for the Ripogenus Project. This study is needed to quantify project effects on a potential source of fish mortality and injury.

***Project Nexus***

Generator trip events at McKay Station occur with some frequency and it is a matter of record that two such events occurred during the August-September timeframe of 2021 when strandings were photographically documented.[8] It is hard to image aspects of project operations that could have a more direct relationship with the welfare of aquatic organisms than immediate, drastic flow reductions.

***Methodology***

Task 1: Operational Data Review:

> Prior to conducting the field investigation, a desktop literature review will be performed to gather information on the range of flows when generator trip events are likely to occur. We anticipate that since thunderstorms occur during the summer, whitewater flows generally of 2200 – 1800 cfs would generally be in effect when the outages occur.

Task 2: Field Surveys:

> The field survey will consist of a reconnaissance level evaluation where a field crew will examine potential stranding sites in the study area at an appropriate time interval after spilling operations have ceased. Any accessible pools with fish stranding potential will be identified and visited shortly after the spillage event. On-ground surveys will traverse any pools and visually document fish present as well as looking for fish trapped under rocks. Information on the number and location of fish stranded will be recorded. In addition, the conditions of the study area will be photo-documented.

***Consistency with Generally Accepted Scientific Practice***

The proposed survey to document potential stranding areas is an accepted means of documenting species use in the Project area.

***Deliverables and Schedule***

The survey effort will be conducted during the summer/fall of 2022. Data and results will be included in the Initial Study Report to be filed with FERC in 2023.

***Cost and Level of Effort***

The estimated cost for the stranding evaluation is approximately $20,000. This level of effort is consistent with the size of project operations.

The Applicant may be able to combine this study with any testing of equipment and procedures ordered by the FERC Compliance Division as part of its investigation in the low flow events previously referenced, especially generator trip events. This could provide significant cost savings lowering the cost estimate provided above.

[8] TU Letter dated September 21, 2021, Subject: Maine Council of Trout Unlimited Report of Observed Low Flow Events for the Ripogenus Project (P-2572); TU Letter dated January 5, 2022, Subject: Maine Council of Trout Unlimited Amplifying Report for Observed Low Flow Events for the Ripogenus Project (P-2572).

TU supports the study request made by Ed Spear for a "Ramping and the Need to Determine the Appropriate Rate of Flow Change Below McKay Station"[9] as an appropriate and valuable follow on to the stranding study.

**Baseline Fisheries Assemblage Studies.** Ten individual study requests were submitted in TU's PAD Comments that correspond to the reaches where assemblage studies were specified and included in the PAD. Brookfield rejected the study requests in toto without addressing each request specifically. Brookfield says that the fish assemblage data exists but does not provide it in anything resembling an organized manner. In the PSP Teleconference, Brookfield implied that providing this information is a MDIFW responsibility. It is not, and fisheries information is addressed specifically by 18 CFR § 5.6 (d)(3)(iv) as a PAD requirement.

Maine TU Council requests that Brookfield provide all the fish assemblage information as a coherent report. Conducting some of the specific fisheries assemblage studies contained in our prior request may be the only way for that to be ultimately accomplished. Current fisheries assemblage data should have been provided in the PAD, not the information from the last relicensing. Brookfield's actions thus far have served to confuse and delay the provision of information specifically required by 18 CFR § 5.6.

**Other Studies:**

Maine TU Council will continue to support the studies supported in our PAD Comments:

1. MDIFW for these proposed studies that bear directly on their ability to manage resident species:
    1) Exposed Aquatic Habitat Assessment
    2) Landlocked Salmon Habitat Use/Spawning Study—Penobscot Mills Project
    3) Minimum Flow Analysis of Back Channel [West Branch below Stone Dam]
    4) Macroinvertebrates Study Request—Ripogenus Project

2. NMFS for these flow and temperature related studies. **These studies are essential to establishing appropriate terms and conditions for the relicensing.** Without data and analysis of flow and temperature to inform the process, it will be impossible to correct the dewatering and other obvious problems associated with the projects caused by the permissive operating parameters granted under the last relicensing to cater to the Millinocket paper mills. TU fully supports inclusion of these studies for the reasons stated in detail by NMFS in its PSP Comments.[10] While these studies are fully justified on the basis of effects on Atlantic salmon, the information would be invaluable for determining the effects of flows on resident fish species and other aquatic organisms as well:
    1) A Study to Evaluate the Effects of Operating the Penobscot Mills and Ripogenus Dams on the Hydrology of the West Branch and Mainstem Penobscot River Using an Indicators of Hydrologic Alteration Model (IHA)
    2) A Study to Evaluate Project Effects on River Temperature in the West Branch and Mainstem Penobscot River
    3) A Study to Evaluate Future Flow and Water Temperature Scenarios

[9] Ed Spear Letter dated February 12, 20022, Accession number 20220214-5027.
[10] NMFS letter dated February 17, 2022, RE: Comments on Great Lakes Hydro America, LLC (GLHA) Proposed Study Plan for the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458).

TU continues to support the NMFS request for operational data that Brookfield has yet to supply.[11]

3. MDMR for studies for American eels and passage alternatives for all historic anadromous species:

1) Three-Dimensional Computational Fluid Dynamics (CFD) Modeling Upstream and Downstream of the Discharge and in the Vicinity of Powerhouse Forebays
2) Upstream Juvenile Eel Assessment
3) Downstream American Eel Passage Assessment
4) Downstream Passage Alternatives Study
5) Upstream Passage Alternatives Study
6) Evaluation of the Size of American Eels and the Timing of their Downstream Migratory Movements

4. USFWS for the following due to their potential positive impact on the ecology of the entire Penobscot Watershed:

1) Upstream American Eel Passage Assessment
2) Downstream American Eel Passage Assessment
3) Downstream Passage Alternatives Study [eels]
4) Evaluation of the Size of American Eels and the Timing of their Downstream Migratory Movements
5) Freshwater Mussel Survey

5. American Rivers and the Appalachian Mountain Club for the following: aesthetics and other uses are also important to TU members. The first study is absolutely essential to identify changes that have occurred since the last license was issued and to identify needs for the next licensing period. Whitewater flows have proven to be highly compatible with fishing-related activities on the West Branch. Care must be taken to assure commensurate minimum flows:

1) Recreation Facility Inventory, Recreation Use and Needs Assessment, Aesthetics and Reservoir Surface Area Assessment Study
2) Controlled-flow Whitewater Boating and Access Study
3) Aesthetics Resources Study

6. The standard MDEP suite of study requests conditioned to provide sampling in the generally dewatered reaches of the main stem of the West Branch of the Penobscot River in upper Ripogenus Gorge and below Stone Dam. While the specific legislation allows major changes to the littoral zone, with the severe changes to impoundment levels that have been extensively documented by numerous photographs and comments, the limnetic and profundal zones have likely been impacted as well. Study is indicated, and this does not represent a conflict with the statutory language

7. TU additionally asks that Brookfield either accept the socioeconomics study request submitted by the Penobscot Indian Nation[12] or acknowledge that there has been a significant change in the economics and demographics of the region since the mills have closed. While the comments submitted by Economics Professor Sharon Klein more than justify the study,[13] it would be

[11] Ibid.
[12] Penobscot Nation letter dated October 12, 2021, RE: Penobscot Mills (P-2458-247) and Ripogenus (P- 2572-133) Notice of Intent, Pre-application document, Scoping document #1 and study requests.
[13] Dr. Sharon Klein Letter dated February 18, 2022, RE: Penobscot Mills (P-2458-247) and Ripogenus (P- 2572-133) Proposed Study Plan.

preferable that the Applicant simply acknowledges the obvious, that the regional economic situation has significantly changed, as a show of good faith going forward in the relicensing process.

8. Maine TU Council will also support the other MDIFW study requests. Ripogenus-Chesuncook water levels are inextricably linked to the general ecology of the region, its wildlife and the fish both in the impoundment and the flowing waters of the West Branch.

9. Brookfield is not complying with FERC requirements regarding recreational facilities information, specifically 18 CFR § 5.6 (d)(3)(vii) and (ix). Studies need to be conducted to identify potential access sites that will need to be created when the reach of the West Branch below Stone Dam is continuously watered.

10. Our final comment in this section involves the Study to Evaluate the Effects of Operating the Penobscot Mills and Ripogenus Dams on the Hydrology of the West Branch and Mainstem Penobscot River Using an Indicators of Hydrologic Alteration Model (IHA) referenced and supported above. Currently Ripogenus Gorge is watered only nine months of the year and then only with 100 cfs. It is important that this study address macroinvertebrate production over a range of flow scenarios. The waters below McKay Station contain as abundant macroinvertebrate populations as anywhere in the state. The project dewaters areas of the gorge upstream of McKay Station that could be just as abundant. Increased abundance would be expected to produce gains in salmonid size quality and abundance downstream. Water in the upper gorge would also provide enhanced aesthetics of the views of Maine's most significant gorge from the trail above. Water in the upper gorge would also buffer the effects of generator outage flows by being additive to the 400 cfs flows through the generators. Accordingly, evaluation of all these factors under a range of flow conditions is essential to maximizing use of the resource that the West Branch of the Penobscot below Ripogenus Dam represents.

**Administrative Comments**

1. All official comments submitted for these relicensings that bear the TU logo were the product of the Maine TU Council FERC Committee, were approved by the then Chair of Maine TU Council C. E. (Mac) McGinley, and are consistent with Maine Council and TU National policy and the TU mission. Further TU comments will have been approved or signed by his successor Matthew Streeter as Maine TU Council Chair.
2. Each page of the PSP contains the annotation "*Copyright © 2021, Great Lakes Hydro America, LLC. All rights reserved.*" Per our prior comments: "*The FERC process is a public one that actively seeks comments from the public. While these notations were appropriate to the documents before they were filed to the FERC dockets, once they were posted, the document became part of the public domain. Accordingly, the notation became incorrect the moment the document was filed. Including it can only serve to confuse those unfamiliar with the process, and discourage use of the filing in the media. The notation should NOT be included in future filings for these relicensings."*[14]
3. TU has still not received studies referenced in the Pre-application Document (PAD) but not included. These were requested multiple times by TU.[15] Brookfield has provided web addresses not

[14] Maine TU Council PAD Comments dated October 9, 2021, page 3.
[15] Id., page 14.

documents. Brookfield has yet to provide a compilation of fisheries information required by 18 CFR §5.6.

Respectfully submitted,



Matthew Streeter
Maine TU Council Chair

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JANET T. MILLS
GOVERNOR

MELANIE LOYZIM
COMMISSIONER

February 21, 2022

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

RE: Comments on the Proposed Study Plans for the Ripogenus (FERC No. 2572) and Penobscot Mills (FERC No. 2458) Hydroelectric Projects

Dear Secretary Bose:

The Maine Department of Environmental Protection (Department) received and reviewed Proposed Study Plans submitted on November 22, 2021 by Great Lakes Hydro America, LLC (GLHA, or Applicant), a subsidiary of Brookfield Renewable, for the Ripogenus and Penobscot Mills Hydroelectric Projects, located on the West Branch of the Penobscot River. Department staff attended a Proposed Study Plan meeting on December 15 and 16, 2021 and reviewed appropriate Project documents to prepare the following comments, recommendations, and study plans.

As identified in Department comments on the Pre-Application Documents for these projects, the proposed relicensing of the Ripogenus and the Penobscot Mills Projects are subject to water quality certification provisions under Section 401 of the Federal Water Pollution Control Act (a.k.a. Clean Water Act or CWA). By Executive Order of the Governor of the State of Maine, the Department is the certifying agency for water quality certifications.

Comments on the Relicensing Study Plans

The Department appreciates the effort of the Applicant to prepare the Relicensing Study Plans. Project study plans must be designed to evaluate the impact of project operations with respect to all of Maine's applicable water quality standards, including designated uses and both narrative and numeric criteria. Water quality classification in the West Branch Penobscot River has been proposed for upgrade and so may change in the near term from information around water quality classification and standards that was provided to project proponents in the Department's PAD comments; we will do our best to keep everyone informed of the Legislature's decisions as we move forward.

In addition, the Ripogenus Project was the subject of a use attainability analysis (UAA) at its last relicensing. The UAA found …"it is not possible, feasible or desirable to operate the Ripogenus impoundment in such a way that would maintain the natural standard." EPA, in its approval of the UAA clarified that meeting a natural standard was not at issue but that the UAA needed to demonstrate that the Ripogenus Project precludes the attainment of the criteria in the Class C habitat and aquatic life use, and it is not feasible to operate the dam in a way that will result in the attainment of that use, in part because the aquatic community that has evolved in the impoundment and downstream waters constitute an important fishery resource that would be at risk should the project's operation be significantly altered…".

AUGUSTA
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
(207) 287-7688 FAX: (207) 287-7826

BANGOR
106 HOGAN ROAD, SUITE 6
BANGOR, MAINE 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, MAINE 04103
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04769
(207) 764-0477 FAX: (207) 760-3143

website: www.maine.gov/dep

The UAA resulted in revisions to Maine's Water Classification Program[1] regarding aquatic life and habitat criteria in the impoundment associated with the Ripogenus Development that requires the existing impounded waters (collectively known as Chesuncook Lake but including Ripogenus Lake, Caribou Lake, Brandy Pond, Black Pond, and Moose Pond) remain classified under Section 465-A[2]. Because those impounded waters are subject to water level fluctuations that have an effect on the habitat and aquatic life in the littoral zone so that the habitat and aquatic life differ significantly from that found in an unimpounded great pond and so may be unable to meet GPA criteria for habitat and aquatic life, the project proponent must demonstrate that those waters are able to support all indigenous species of fish and must also demonstrate that the structure and function of the resident biological community in the impounded waters is maintained.

In order to evaluate whether the impounded waters support all species of fish indigenous to those waters, the Applicant must conduct a fish assemblage study in order to draw a comparison to the fish assemblage indigenous to those waters. Typically, such studies are proposed by Maine's Department of Inland Fisheries and Wildlife; although DIFW didn't request such a study Trout Unlimited's fish assemblage study request was declined and so the Department supports TU's request here and has attached its supporting study request.

Additionally, the Applicant must demonstrate that all designated uses are met in Project waters, including navigation. The designated use of navigation has been questioned by property owners and users of the Ripogenus impoundment, who indicate that access to the impounded waters is not sufficient at all times, particularly when the water is drawn down. The Applicant must demonstrate that access to Project water is available throughout the recreational season.

Water Quality Monitoring Studies - Department Study Requests

Impoundment Aquatic Habitat and Aquatic Life. The Proposed Study Plan indicates the Applicant intends to use standard macroinvertebrate sampling techniques to evaluate attainment of aquatic life criteria in the Ripogenus impoundment, however macroinvertebrate sampling in lakes and impoundments requires different methodologies than typically used in rivers. Therefore, the Department requests the Applicant identify the percentage of wetted littoral zone to be maintained and recommends that the Applicant consult directly with Department staff to establish sample locations and methodologies to sample impoundment macroinvertebrates so that data collected is sufficient for the Department to make its determination regarding attainment of applicable aquatic life criteria. The Proposed study plan indicates that the Applicant does not propose to complete an impoundment aquatic habitat assessment for Millinocket (Quakish Lake and Ferguson Pond), Dolby and East Millinocket developments because they are operated as run-of-river facilities. The Applicant must demonstrate that applicable water quality standards, including aquatic life criteria, are met in all Project waters in order to be certified that the Project meets water quality standards. The responsibility to make that demonstration lies with the Applicant and so reliance on operational mode means that submission of flow and water level data at each of those impoundments will be required to demonstrate whether the Project adheres to the run-of-river operations at all times.

[1] See 38 M.R.S. § 464(9-A)(A).
[2] 38 M.R.S. § 465-A provides classification standards for great ponds and natural lakes and ponds less than 10 acres in size, and includes impoundments of rivers that are defined as great ponds pursuant to section 480-B because they are greater than 30 acres in size.

Riverine Aquatic Habitat. The Proposed Study Plan indicates the Applicant intends to study riverine aquatic habitat at the Ripogenus Development only in the upper gorge, and will collect measurements of water depth, water velocity, wetted width, substrate types and zone of passage conditions. The Department does not oppose collection of those metrics, but requires that the Applicant analyze the data to determine the flow at which at least 75% of the bankfull cross-sectional **area** is continuously watered. Further, the Department does not agree that data collected in previous relicensing efforts demonstrates the impacts of Project operations on the resource and reiterates here that the riverine aquatic habitat below McKay Station must be studied to demonstrate that proposed Project operations meet the applicable habitat criteria, particularly whether 75% of the cross-sectional area remains watered at all times, compared to bankfull conditons. Reliance on studies conducted during prior relicensing efforts do not demonstrate attainment of applicable aquatic habitat or aquatic life criteria under the operating regime conditioned by that license. A demonstration of attainment is necessary for a fully informed water quality certification. Further, the highly variable flows downstream of the Project dam can affect habitat, including the potential for fish and other aquatic life to become stranded in ledge pools as water levels rise and fall as a result of flow variations. Of particular concern to Trout Unlimited are the station trip flows (400 cfs) and whether such flows adequately maintain 75% of the wetted area downstream of the Project, and whether sudden reduction in flows to 400 cfs cause fish to become stranded. The Department supports TU's study request as it relates to Project operational flows on the riverine habitats affected by the Project.

With respect to the Penobscot Mills Project, the Department reiterates here that GLHA must demonstrate that at least 75% of the cross-sectional area of the outlet streams (including Millinocket Stream and the West Branch of the Penobscot River) are wetted at all times. The proposed study plan is not specific as to how the Applicant will make that demonstration but indicates it will collaborate with the Department on its re-evaluation.

Thank you for the opportunity to review and comment on proposed studies for the Ripogenus and the Penobscot Mills Hydroelectric Projects. In addition to the attached Study Request for a fish assemblage study to demonstrate attainment of habitat criteria in the Ripogenus impoundment, the Department supports the study requests of other agencies and non-governmental organizations.

Sincerely,



Kathy Davis Howatt
Hydropower Coordinator
Department of Environmental Protection

Maine Department of Environmental Protection

Study Request

Ripogenus Hydropower Project (FERC No. 2572)

**Impoundment Fish Assemblage Study**

1. **Describe the goals and objectives of each study proposal and the information to the obtained.**
   Fish assemblage within the Ripogenus impoundment is an important metric to establishing that Project operations meet water quality standards, including a special law enacted by Maine Legislature for this impoundment. Assessment of this criteria provides information to evaluate the aquatic habitat of the Ripogenus impoundment, including the waters of Ripogenus Lake, Caribou Lake, Brandy Pond, Black Pond, and Chesuncook Lake and the impact of the dam structure and operation on those habitats and on the fish assemblage in the West Branch of the Penobscot River that drop out of the lake and into the river. The objective of this study proposal is to determine if the project impoundment meets Maine Water Quality Standards, including that the existing impounded waters are able to support all species of fish indigenous to those waters, and demonstrating, in part, attainment of the designated use of habitat for fish and other aquatic organisms.

2. **If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.**
   The resource management goal is to ensure attainment of Maine Water Quality Standards pursuant to the provisions of the ***Water Classification Program***, 38 M.R.S. Sections 464-468 and to certify attainment of such, with any necessary conditions, under Section 401 of the Federal Water Pollution Control Act (a.k.a. Clean Water Act).

3. **If the requestor is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.**
   Requestor is a resource agency.

4. **Describe existing information concerning the subject of the study proposal, and the need for additional information.**
   The Proposed Study Plan presents studies planned by the Applicant to investigate the impacts of operations and proposed operations of the Ripogenus Hydroelectric Project, however the applicant does not propose to conduct a Fish Assemblage Study to demonstrate whether the Project meets the requirements of Maine Law related to aquatic habitat in the Ripogenus impoundment. The Applicant will need to demonstrate that the project operation supports all species of fish indigenous to those impounded waters.

5. **Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.**
   Data collected will identify the presence and relative abundance of fish species present and will be used to demonstrate effects of Project drawdowns on the resident fish. Information will be used to evaluate whether the project meets Maine designated use of the Project waters' habitat and aquatic life criteria, which will inform the water quality certification process.

6. **Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate filed season(s) and duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.**
   The Department does not regularly request fish assemblage studies and so will rely on established study protocols used successfully throughout the State by the Applicant and others.

7. **Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs.**
   A survey of resident and stocked fish should be made during open water season and should include each basin that comprises the Ripogenus impoundment. A fish assemblage study can be completed in one field season. Costs are considered reasonable given that this study is required for Maine water quality certification and is routinely completed at hydropower projects being relicensed in the State. No alternatives to this study are proposed.

February 22, 2022

Ms. Kimberly D. Bose
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Via online submission to: http://www/ferc.gov (cross-filed)**

**Subject: Comments of the Atlantic Salmon Federation on the Proposed Study Plan for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458)**

Dear Secretary Bose:

The Atlantic Salmon Federation ("ASF") hereby submits the following comments on the Proposed Study Plan (PSP) for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) filed for Great Lakes Hydro America, LLC by Brookfield Renewable ("Brookfield" or "Applicant") dated November 22, 2021.

ASF is an international non-profit organization dedicated to the conservation and restoration of the wild Atlantic salmon and its environment. ASF represents more than 8,000 members in the United States. We also represent more than a dozen affiliated local conservation and watershed groups across the State of Maine via our Maine Council, representing more than 2,000 additional volunteers and supporters. ASF has a long history of advocating for the restoration of the Penobscot River ecosystem and its native fisheries, and has also invested (and is continuing to invest) substantial time and funding to open-up significant quantities of historic habitat in all corners of the watershed through myriad on-the-ground habitat restoration and connectivity projects.

**General Comments**

The Applicant stated in the Pre-application Document (PAD) that "…*the Projects operate under an array of highly beneficial and effective PM&E measures that enhance aquatic and terrestrial habitats throughout the Project areas, while serving as a critical component for the seasonal management of water flows throughout the Penobscot River Basin. These PM&E measures comprehensively address resource interests specific to the Project areas as well as the larger river basin.* ". [PAD, Vol I, Part 1, page 1-8] This is clearly far from the truth as the multiple pictures submitted by camp owners on the Ripogenus-Chesuncook Impoundment showing severe dewatering of the impoundment clearly demonstrate. This assertion taints the Applicant's assessment of the need for current

studies. For this and other reasons outlined in the joint filing by Maine Council of Trout Unlimited, Appalachian Mountain Club, American Whitewater, Caribou, Chesuncook Lake Camp Owners Association, Chesuncook Dam Camp Owners Association, the Allagash Gateway Campground, and Andre Emerson Cushing Corporation dated February 21, 2022, ASF supports that filing and asks that FERC require Brookfield inform the process using current study data, not studies from the last relicensing. Using this as a basis, Brookfield only accepted three of the more than thirty study requests submitted.

Finally, if Brookfield will not acknowledge that the socioeconomic context of the projects has changed and cease basing its positions on a situation that no longer exists, ASF requests that Brookfield undertake the socioeconomics study request submitted by the Penobscot Indian Nation [Penobscot Nation letter dated October 12, 2021, RE: Penobscot Mills (P-2458-247) and Ripogenus (P-2572-133) Notice of Intent, Pre-application document, Scoping document #1 and study requests.]

**Specific Comments**

The operation of the six dams associated with the Ripogenus and Penobscot Mills Projects dictates the quality, quantity, and timing of water entering the Penobscot River from the West Branch, thus impacting the entire river ecosystem below the Projects. In addition, the presence of these Projects prevents sea-run fish from accessing large quantities of historic habitat within and above the Projects, both impacting the natural ecology of the waters of the West Branch and substantially decreasing the abundance of these species in the Penobscot, further impacting the ecosystem from its headwaters to Penobscot Bay. These Projects directly affect the recovery of endangered Atlantic salmon and impact the species' designated critical habitat and its constituent elements. The scale and magnitude of these impacts is unknown at this point, so it is imperative that the studies associated with relicensing these Projects provide the information requisite to understanding the effects of the Projects. A full understanding of the impacts is the only way to inform the actions necessary to eliminate, avoid, minimize, or mitigate the impacts and thus improve the health and quality of the environment in the West Branch and mainstem Penobscot. As such, ASF supports the following study requests:

1. The requests from the National Marine Fisheries Service for the following key flow-related studies. These studies are justified based on effects downstream on endangered Atlantic salmon:

    1) A Study to Evaluate the Effects of Operating the Penobscot Mills and Ripogenus Dams on the Hydrology of the West Branch and Mainstem Penobscot River Using an Indicators of Hydrologic Alteration Model (IHA)

2) A Study to Evaluate Project Effects on River Temperature in the West Branch and Mainstem Penobscot River

3) A Study to Evaluate Future Flow and Water Temperature Scenarios

2. The requests from the Maine DMR for studies for American eel and passage alternatives for all historic anadromous species:

    1) Three-Dimensional Computational Fluid Dynamics (CFD) Modeling Upstream and Downstream of the Discharge and in the Vicinity of Powerhouse Forebays

    2) Upstream Juvenile Eel Assessment

    3) Downstream American Eel Passage Assessment

    4) Downstream Passage Alternatives Study

    5) Upstream Passage Alternatives Study

    6) Evaluation of the Size of American Eels and the Timing of their Downstream Migratory Movements

3. The requests from U.S. Fish & Wildlife Service for the following studies on American eel and freshwater mussels to inform decisions that will benefit the ecology of the Penobscot Watershed:

    1) Upstream American Eel Passage Assessment

    2) Downstream American Eel Passage Assessment

    3) Downstream Passage Alternatives Study [eels]

    4) Evaluation of the Size of American Eels and the Timing of their Downstream Migratory Movements

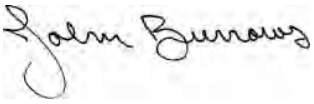
    5) Freshwater Mussel Survey

4. The request from the Maine Department of Environmental Protection for its standard suite of water quality studies.

5. The request from Trout Unlimited for fish assemblage studies. The information provided will bear on future efforts to restore Atlantic salmon and co-evolved native species to waters included in the Penobscot Mills Project. Information provided in the PAD was outdated, the applicant has yet to provide the fisheries data required by 18 CFR §5.6 in a coherent manner.

ASF appreciates the opportunity to comment on the PSP for this proceeding. We believe that the study requests referenced above are essential to understand the current project impacts on native fisheries, water quality and flows, instream aquatic habitat, and overall river ecosystem health. The results of these studies will greatly assist the Commission in conducting a meaningful NEPA analysis of the Projects, resulting in a substantially more informed relicensing decision that truly balances the costs and benefits of these Projects.

Respectfully submitted,



John R.J. Burrows
Executive Director of U.S. Operations
Atlantic Salmon Federation

**Filed via "eFiling"**

February 22, 2022

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Division
888 First Street, N.E.
Washington, D.C. 20426

**RE: Comment on PSP, Ripogenus Project (FERC No. 2572) and Penobscot Mills Project (FERC No. 2458)**

Dear Secretary Bose,

On June 11, 2021, with the submittal of the Pre-Application Document (PAD) Great Lakes Hydro America, LLC (GLHA), a subsidiary of Brookfield Renewable, initiated the Integrated Licensing Process (ILP) for the Ripogenus Hydroelectric Project (FERC No. 2572) and the Penobscot Mills Hydroelectric Project (FERC No. 2458) (the Projects). On October 9, 2021, the Bureau of Parks and Lands submitted comments on the PAD, including comments on proposed studies and study requests. GLHA submitted the Proposed Study Plan (PSP) on November 22, 2021.

As stated in our previous comments, the Bureau of Parks and Lands (BPL) is a division of the Maine Department of Agriculture, Conservation and Forestry (MDACF), a cabinet level agency of the State of Maine. As authorized under Section 10 of the Federal Power Act, BPL reviews hydropower projects and provides recommendation to licensees with a focus on the adequacy of existing public recreation facilities and access to meet public needs, the adequacy of flow releases to provide for downstream boating opportunities, and the effect, if any, on public lands and private lands if available for public recreation.

Based on these responsibilities we have prepared the following comments on the PSP:

GLHA Responses to BPL comments on PAD Section 5.8: Recreation and Land Management
BPL commented on five individual topics within this section of the PAD, seeking clarification or correction of the information provided. However, GLHA has not provided substantive responses to the Bureau's comments. Instead, in PSP Appendix J, pages 9-10, GLHA provided the

following response to all five comments, referring to the future Recreation Study: "GLHA is proposing to conduct a Recreation Study (Appendix F of this PSP). Study results will be included in the study report to be filed with FERC in April 2023."

Rather than assume the Recreation Study will provide the necessary information, the Bureau requests that complete and accurate information on Project recreation sites and related topics be provided before the Recreation Study Plan is finalized. We consider accurate and complete information related to these topics essential to the success of the Recreation Study.

1.2.2 GLHA's Proposed Study Plan – Recreation Study

*Assessment of Boat Access to Impoundments*

In Table 1-1, page 1-20, GLHA provide a summary of their responses to BPL's study requests for assessment of boat access to Ripogenus Impoundment, North Twin Impoundment and Millinocket Lake with Drawdown, indicating that the requests were "Not adopted as requested. Portions of Requested Study adopted into other studies." The Recreation Study Plan, found in Appendix F of the PSP, provides the specific responses to our requests, both those that were adopted and not adopted.

The Bureau appreciates GLHA's decision to include assessment of boat access to Ripogenus Impoundment in the Recreation Study, as indicated on page F-1. However, BPL is disappointed that GLHA, as stated in the Recreation Study Plan, Section 10.0 - Deviations from Requested Study, is not proposing to similarly assess boat access to the North Twin Impoundment and Millinocket Lake as BPL also requested. GLHA's justification for this determination is "they are held close to full pond level throughout the normal recreation season."

Based on the data GLHA has provided to-date within the ILP, we are not able to discern the accuracy of this statement and thus the validity of the justification to not conduct the requested study. We therefore remain reliant on the FERC-permitted drawdown limits (10 feet at Millinocket Lake year-round; 3.5 ft drawdown at North Twin until October 15). Note also that the Bureau is interested in verifying boat access on these water bodies through the ice-free season (generally May through November), six weeks beyond the end of the North Twin drawdown limit and perhaps beyond the undefined "normal recreation season" cited by GLHA. Due to the lack of operational data and the lack of data on the range of impoundment levels that each boat access facility is fully functional, as mentioned in our study request, public boat access to these water bodies through the ice-free season remains unverified.

In closing, the Bureau reiterates the importance that the ILP ensure public access to North Twin impoundment and Millinocket Lake throughout the ice-free season.

*Assessment of Boat Access to the "Back Channel" (Penobscot Mills Project)*

In response to requests from the Maine Department of Inland Fisheries and Wildlife (MDIFW) and other stakeholders, GLHA has proposed to conduct a Back Channel Instream Flow and Habitat Assessment Study. As described in the Study Plan, provided in PSP Appendix B, the methodology of the study includes evaluation of flows in the range of 3 to 2,000 cfs. Although the purpose of the study is to evaluate a minimum flow regime most suitable to establish a seasonal put-and-take adult brook trout fishery, the potential exists for such flows to also provide

a recreational boating opportunity on the Back Channel. Under the current license, Back Channel flows are limited to spillage from Stone Dam at most times, therefore no boating opportunity exists.

BPL requests, in the event that the Back Channel Instream Flow and Habitat Assessment Study results in boatable flows on the Back Channel, that the Recreation Study include:

- assessment of public road access to the channel (presumably, access to a newly established fishery would also be required; therefore, this request may coincide with fishery-related requests and not require additional effort);
- assessment of potential put-in and take-out locations on the channel for paddle-craft, and
- assessment of a portage route around Great Falls.

1.2.2 GLHA's Proposed Study Plan – Aesthetics Study and Recreation Study (Aesthetic Component)

GLHA has not adopted the Aesthetic Resources Study requested by American Whitewater (AW) and Appalachian Mountain Club (AMC), as recorded in PSP Table 1-1, page 1-21. The justification given is the lack of a substantiated problem with substantial light or glare, and the lack of adverse aesthetic impacts of Project infrastructure in their remote and largely undeveloped setting. However, these justifications do not address the aesthetic impact of impoundment drawdown, in particular at the Ripogenus Impoundment (Chesuncook Lake).

AW and AMC also requested that an aesthetic assessment be included as a component of the Recreation Study. GLHA has not adopted the aesthetic component, with the justification that it is overly expansive in both geographic and regulatory scope.

However, FERC, in Scoping Document 2 (SD2, released November 22, 2021), section 4.1.5 Recreation, Land Use, and Aesthetics, in response to numerous stakeholder comments identifies the following resource issue to be analyzed in the NEPA document:

- Effects of continuing to operate and maintain the Projects, including the effects of the drawdowns and low lake levels, on aesthetic resources in the Projects' areas.

Concerns about adverse effects of drawdown on aesthetic resources at Chesuncook Lake, as well as boat navigation and water access to camps and public campsites, has been substantiated by comments from Chesuncook Lake campowners and others (see PSP Appendix I, comments submitted by J. Lepage, 9/28/21; L. Paone, 9/29/21; K. Houston, 10/2/21; O. Genest, 10/5/21; and others). In light of the above, BPL requests that an analysis of the effects of drawdown and low lake levels on aesthetic resources at Chesuncook Lake be incorporated into the Recreation Study. This analysis should address views of the lake and surroundings from FERC-approved recreation sites (as GLHA intends to do as described in the Recreation Study, page F-11) as well as from the lake surface by boaters.

Requested Operations Data

In PSP Appendix J, page 2, GLHA states in response to requests from BPL and others that 10 years of operations data "will be provided with the RSP or before". It is our belief that this data

should be provided well before the RSP is submitted, because it is essential in determining study needs for the ILP.

Thank you for the opportunity to submit these comments. Please feel free to contact me at (207) 287-2163 or via email at Jim.Vogel@maine.gov if you have any questions regarding these comments and study requests.

Sincerely,



James Vogel, FERC Coordinator
Bureau of Parks and Lands

Cc: Amanda Beal, Commissioner, Maine Department of Agriculture, Conservation and Forestry
Andrew Cutko, Director, Bureau of Parks and Lands
John Perry, Maine Department of Inland Fisheries and Wildlife
Randall Dorman, Brookfield Renewable

JANET T. MILLS
GOVERNOR

STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
353 WATER STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041

JUDITH CAMUSO
COMMISSIONER

***Via Electronic Filing***

February 22, 2022

Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

**Re: MDIFW Comments on the Proposed Study Plan for the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458)**

Dear Secretary Bose:

On November 23, 2021, Great Lakes Hydro America, LLC (GLHA), a subsidiary of Brookfield Renewable (Brookfield, Licensee), submitted their Proposed Study Plan (PSP) for both the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458). The Projects are located on the West Branch of the Penobscot River and Millinocket Stream, and span both Piscataquis and Penobscot Counties, Maine.

On December 15 and 16, 2021, GLHA held their PSP meeting, which MDIFW staff attended. GLHA reached out to MDIFW regarding several of our Agency's wildlife Study Requests and subsequently hosted a virtual meeting with MDIFW staff on February 9, 2022. We appreciate the Licensee's willingness to confer with MDIFW regarding our proposed wildlife studies in addition to the PSP meetings, and MDIFW and GLHA have made some important strides in resolving some of the disparities between our original wildlife Study Requests and the PSP. However, we remain concerned that the requested operational data for these Projects are still not available, and the perceived changes in Project operations from when the Millinocket and East Millinocket Mills were operational are currently making it difficult to adequately assess environmental impacts during this relicensing period.

*Except as described below*, we respectfully request that FERC adopt the study and information requests made in our MDIFW Comments and Study Requests filed on October 8, 2021. To be clear, our Agency is utilizing this limited period of time between 30- to 50-year Federal licenses to become better informed on how current Project operations are affecting inland fisheries and wildlife resources and their respective habitats in the Project areas. MDIFW believes that the only way to better understand these complex interactions is through the Study Requests we have proposed.

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## Section 3 Requested Studies Not Adopted

In their PSP, multiple study requests were not adopted by GLHA, including several wildlife studies recommended by MDIFW. Subsequent to the December PSP meetings, however, GLHA met virtually with MDIFW to discuss alternatives to the proposed wildlife studies. Our comments below reflect our understanding of the current status of each study.

So that MDIFW can be kept abreast of the ongoing field efforts for these significant, complicated, and extremely remote Projects, MDIFW is willing to partner with GHLA in some of the wildlife surveys, as staff time allows and with adequate notification and planning.

### 3.13 Study to Assess Presence of Wood Turtles and Project Effects on Nesting Habitat, Nesting Success, and Overwintering Habitat

MDIFW requested a study to assess the presence of wood turtles and Project effects on their nesting habitat, nesting success, and overwintering habitat.

Current status: This study request was originally denied in GLHA's PSP. However, as discussed during the February 9 virtual meeting between GLHA and MDIFW, it is our understanding that GLHA will contact MDIFW's reptile expert to discuss suitable survey locations, based off aerial imagery interpretation. Onsite assessments of these survey locations will consist of documentation of available wood turtle nesting habitat along with a description of the habitat relative to the West Branch of the Penobscot River and surrounding environs within the floodplain. Suitable overwintering habitat will be similarly recorded. GLHA will also assess how the magnitude and timing of flow releases may be affecting these habitats, both through field measurements and information gleaned from the Historical Operations Data and Assessment Study. Any wood turtles that are observed will be documented, their location recorded via GPS, sexed, aged, photographed, and be marked by shell notching using the Ernst et al. (1974) scheme. This information will be reported to MDIFW at the end of the season, including a discussion on the effects of Project operations on these resources and nesting success. The results of this Phase 1 Study may necessitate a more robust Phase 2 Study, including the use of telemetry. These study details, including methodology, goals, and anticipated reporting requirements, should be clearly explained in the Revised Study Plan.

### 3.14 Marsh Bird Surveys

MDIFW requested a Marsh Bird Survey to determine if any rare marsh-nesting birds (least bittern, sedge wren, black tern, common gallinule, or American coot) occur in the Ripogenus and Penobscot Mills Project areas, and if operations of the Projects are potentially affecting their productivity.

Current status: This study request was originally denied in GLHA's PSP. However, as discussed during the February 9 virtual meeting between GLHA and MDIFW, it is our understanding that GLHA will contact MDIFW's marsh bird expert, who will provide any existing data as well as discuss suitable survey locations, based off aerial imagery interpretation, in support of GLHA conducting a marsh bird survey in a subset of wetlands within the

boundaries of the Projects. Surveys will follow approved MDIFW marsh bird survey methodology. This information will be reported to MDIFW at the end of the season, including a discussion on the effects of Project operations on these resources. These study details, including methodology, goals, and anticipated reporting requirements, should be clearly explained in the Revised Study Plan.

**3.15 Furbearer Survey**

MDIFW requested a Furbearer Survey at the Ripogenus impoundment to assess the relative abundance of muskrats and beavers by comparing their abundance with a natural reference (control) location of comparable size and shoreline characteristics (wetlands), and to 1) assess muskrat food availability throughout the year, 2) determine overwinter survival and cause-specific mortality rates of muskrats and beavers, 3) measure hydrology characteristics (water flows and depths) in areas of suitable habitat, and 4) determine use and movements of muskrats and beavers.

Current status: This study request was originally denied in GLHA's PSP. However, as discussed during the February 9 virtual meeting between GLHA and MDIFW, it is our understanding that GLHA will document muskrat and beaver activity, including the locations of any houses, lodges, and caches, during the course of the 2022 field season, including into the late fall season. All muskrat and beaver activity will be documented via GPS and photographs, with a description of their status (i.e., active, inactive, abandoned, etc.) as well as their location relative to changing water levels during the course of the season. This information will be reported to MDIFW at the end of the season, including a discussion on the effects of Project operations on these resources. These study details, including methodology, goals, and anticipated reporting requirements, should be clearly explained in the Revised Study Plan.

**3.17 Common Loon Productivity Assessment**

MDIFW requested a Common Loon Productivity Assessment for the Millinocket Lake Storage Impoundment and the North Twin Impoundment to evaluate common loon nesting success, determine if operations of the Project are affecting loon productivity, and assess causes of nest failure to determine if these failures are influenced by Project operations.

Current status: This study request was originally denied in GLHA's PSP. However, as discussed during the February 9 virtual meeting between GLHA and MDIFW, MDIFW reiterated our need for clarification regarding actual headpond water level fluctuations during the common loon breeding season (May 15 – July 31). As described in the PAD:

- Millinocket Lake: current and proposed Project operations maintain the Millinocket Lake reservoir level between elevations 470 and 480 feet at the Millinocket Lake Storage Development while providing water to maintain North Twin impoundment levels.
- North Twin: the Licensee maintains the North Twin impoundment at a relatively stable level from May 1 - August 22 annually ("relatively stable level" is not defined).

GLHA stated that they understood our confusion and will assess annual historic water levels at both Millinocket Lake and North Twin Impoundment during the loon breeding season using information gleaned from the Historical Operations Data and Assessment Study. Any deviations from 0.5 vertical feet up or 1 vertical foot down occurring within a 28-day period during the loon nesting season (May 15 – July 31) will be reported to MDIFW, including a discussion on the effects of Project operations on common loon productivity at these locations. These study details, including methodology, goals, and anticipated reporting requirements, should be clearly explained in the Revised Study Plan.

**3.18 Common Loon Management Plan Assessment**

MDIFW requested a Common Loon Management Plan Assessment for the Ripogenus Project to evaluate the existing Common Loon Management Plan for the Ripogenus Project. The goals of the study would be to assess use of the artificial nest platforms deployed at the Ripogenus impoundment, evaluate loon productivity, and determine if Project operations, particularly during low water years, are impacting loon productivity and if new strategies need to be incorporated.

Current status: This study request was originally denied in GLHA's PSP. However, as discussed during the February 9 virtual meeting between GLHA and MDIFW, MDIFW is requesting additional information on the existing Plan for the Design and Implementation of Artificial Nesting Structures for Common Loons, including but not limited to how well the Plan has been adhered to; annual maintenance and deployment of nesting structures; the status of rafts during periods of drawdowns; and how frequently raft locations are adjusted during drawdown periods. GLHA will investigate and provide this information to MDIFW, at which time an assessment of the effectiveness or need to revisit the Plan will be determined. The goals and anticipated outcome of these investigations should be clearly explained in the Revised Study Plan.

**Appendix B: Back Channel Instream Flow and Habitat Assessment Study Plan**

Regarding the West Branch below Stone Dam ("Back Channel") Instream Flow and Habitat Assessment Study Plan, MDIFW requests that in addition to brook trout, the species list be expanded to include landlocked salmon habitat.

**Appendix C: North Twin Impoundment Tributary Access Survey Study Plan**

As detailed in Table 1-1, the Licensee adopted this study request, but with modifications. However, the significant modifications being proposed do not include the MDIFW requested radio telemetry study to track salmonid movement, in part, because:

*"GLHA believes that radio telemetry is not the appropriate methodology to evaluate tributary access for landlocked salmon."*

Instead, GLHA proposes the North Twin Impoundment Tributary Access Study Plan. MDIFW supports this new study proposal with the following goals and objectives:

- *"Identify tributaries to the North Twin impoundment that are used by landlocked salmon for spawning or that have habitat suitable for spawning;*

- *Survey the identified tributary streams and identify potential fish passage barriers both natural and Project-related near their confluence with the North Twin impoundment; and*

- *Evaluate the effects of the typical seasonal impoundment fluctuation on tributary access by landlocked salmon during critical life stages."*

However, the proposed North Twin Impoundment Tributary Access Study Plan does not address the management focus of the initial MDIFW proposed Comprehensive Impoundment Landlocked Salmon Habitat Use/Spawning Study, including several goals and objectives:

- *Track seasonal movements and behaviors of landlocked salmon (within and between the five connected lakes) via radio telemetry;*

- *Determine the effects of annual Project drawdowns on the movement and behaviors of landlocked salmon within the North Twin impoundment; and*

- *Identify landlocked salmon spawning areas within the North Twin impoundment.*

As previously indicated in the PSP, landlocked salmon were historically stocked periodically in the North Twin impoundment by MDIFW for 17 of the 36 years between 1937 and 1973, then annually from 1976 to 2010, and 2014-2017. A continuously decreasing number of landlocked salmon were stocked during the 2014-2017 timeframe. Stocking of landlocked salmon ended in 2017 after MDIFW gill net surveys at the time indicated a large percentage of captured salmon were of naturally reared origin. Presently, landlocked salmon in the North Twin impoundment consist of a self-sustaining naturally reproducing population relying on adequate and accessible spawning habitats. The Department is continuously striving to improve the landlocked salmon fishery to a healthy balance, and with that maintain an equally healthy population of rainbow smelt, the primary prey species of landlocked salmon. As outlined in the PAD, under the current operating license issued in 1996, Article 408 required GLHA to maintain the North Twin impoundment at a minimum target level of 488.42 feet for the period August 22 through October 15 to accommodate lake trout spawning and incubation in October. However, after periodic lake trout monitoring during the early 2000's it was determined wild lake trout reproduction was not occurring in the impoundment. Therefore, Article 408 was amended in 2012 to remove the minimum target lake elevation level during the period August 22 through October 15. With the minimum target lake elevation now removed, MDIFW believes that the Project's seasonal drawdown cycles could have a negative impact on wild landlocked salmon movement, spawning, and incubation within the impoundment and its tributaries.

MDIFW fisheries management objectives have changed in the North Twin impoundment since the last relicensing of Penobscot Mills. Where historically the landlocked salmon fishery relied on annual stocking of hatchery-reared fish, presently (since 2018) the salmon population has

consisted of 100% naturally reared landlocked salmon. In the past, when the focus was on Project operation effects as they related to attempting to establish a naturally reared lake trout population, little thought was given to location, timing, or even success of landlocked salmon spawning since the fishery was of stocked origin. Today, there is virtually no information on what effects Project operations and seasonal water level fluctuations may have on landlocked salmon life histories, most importantly spawning and rearing potential. Tracking landlocked salmon movements through the use of radio telemetry within the North Twin impoundment will help document potential effects of Project operations on spawning behavior as well as help document timing and spawning locations of naturally reared salmon.

**Comment on Diadromous Species**

Any planned reintroduction of diadromous species into the Penobscot Mills Project should be coordinated with MDIFW based on the outcomes of discussions and research being undertaken within the joint Federal and State partnership of the Alewife Interaction Committee to reach a balanced approach to comanaging resident inland and diadromous species in this and other waters around the State. Density-dependent interactions between anadromous alewives and managed inland fisheries remain an ongoing concern of our Agency. Additional concerns relate to preventing invasive species from being introduced above said licensed Project in the advancement of diadromous fish restoration. We believe there are options that would support both restoration of diadromous species and prevent the spread of invasives at the Penobscot Mills Project. We want to clarify that MDIFW remains committed to working with our State and Federal partners on studying restoration of diadromous species at the Penobscot Mills Project should fish passage be considered during the term of the new license, and MDIFW should be party to any future discussions pertaining to fish passage. Therefore, our comments should not be interpreted as conflicting with the other State and Federal resource agencies that are stakeholders to this relicensing.

The natural resources and other concerns associated with these Projects are very complex, and we appreciate the Licensee's ongoing commitment to work through these issues. We also look forward to our review of the Revised Study Plan as well as partnering with GLHA with any studies as our staff time allows. Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,



John Perry
Environmental Review Coordinator

Cc: Francis Brautigam, Joe Overlock—MDIFW Fisheries Division, Augusta Headquarters
Tim Obrey, Jeff Bagley—MDIFW Fisheries Division, Region E
Kevin Dunham, Kevin Gallant—MDIFW Fisheries Division, Region F

Nathan Webb, Ryan Robicheau—MDIFW Wildlife Division, Augusta Headquarters
Craig McLaughlin, MDIFW Wildlife Research and Assessment Section Supervisor
Danielle D'Auria, Shevenell Webb, Derek Yorks, Beth Swartz, Phillip deMaynadier—MDIFW Wildlife Research and Assessment Section
Doug Kane, Scott McLellan—MDIFW Wildlife Division, Region E
Mark Caron, MDIFW Wildlife Division, Region F
Casey Clark, MDMR
Kathy Howatt, MDEP
Jim Vogel, BPL
Julianne Rosset, USFWS
Jeff Murphy, NMFS

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AUGUSTA, MAINE
04333-0021

JANET T. MILLS
GOVERNOR

PATRICK C. KELIHER
COMMISSIONER

February 22, 2022

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

**RE: Proposed Study Plan Comments for the Ripogenus (FERC No. 2572-133) and Penobscot Mills (FERC No. 2458-247) Hydroelectric Projects**

Dear Secretary Bose:

The Maine Department of Marine Resources (MDMR) is writing in response to the Proposed Study Plan (PSP), dated November 23, 2021, for the Ripogenus and Penobscot Mills Hydroelectric Projects (collectively referred to as Projects), located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot Counties, Maine. The projects are operated by Great Lakes Hydro America, LLC (GLHA; Applicant). GLHA held virtual meetings to discuss the PSP and solicit feedback from stakeholders on December 15, 2021 and December 16, 2021. The comments of MDMR are provided in the following document.

Please contact Casey Clark at casey.clark@maine.gov or at 207-624-6594 if you have any questions.

Sincerely,



Patrick C. Keliher, Commissioner

cc: Sean Ledwin, MDMR
John Perry, Kevin Dunham, Tim Obery MDIFW
Kathy Howatt, MDEP
Peter Lamothe, Julianne Rosset, Bryan Sojkowski, USFWS
Julie Crocker, Jeff Murphy, Don Dow, Dan Kircheis NOAA

OFFICES AT 32 BLOSSOM LANE, MARQUARDT BUILDING, AUGUSTA, MAINE
http://www.Maine.gov/dmr
PHONE: (207) 624-6550 FAX: (207) 624-6024

## General

On October 8, 2021, the Federal Energy Regulatory Commission (Commission; FERC) issued an Additional Information Request for detailed operations data needed to clarify how the projects are operated on a daily basis. Specifically, the Commission requested GLHA include as an appendix to the Proposed Study Plan, 10 years of operations data (in excel format) for each project, or each individual development, in the case of the Penobscot Mills Project, including: (1) daily impoundment elevations; and (2) daily outflows (minimum, maximum, and average discharges). This request is consistent with the information requested by several stakeholders in comments on the Pre-Application Document (PAD) and study requests for Projects. MDMR supports this as a request for additional information that is critical for project scoping. Given that this is data that is readily available to GLHA, MDMR requests that the data be provided to stakeholders within 14 days of this letter.

In the PSP, GLHA states, "GLHA is proposing the studies that meets the criteria and are believed to be required for FERC to perform its environmental analysis for MDEP to issue the Projects' Section 401 Water Quality Certificates, and for FERC to develop the license requirements under which the Projects will operate for the term of the Projects' New Licenses." In our study requests, MDMR included only studies that have been approved by the Commission during relicensing at similar projects in Maine and other New England states. Thus, these studies have been determined by the Commission to be required to inform the Commission's development and analysis in their NEPA document for environmental analysis and for MDEP to issue the Projects' Section 401 Water Quality Certificates. If the studies that MDMR proposed are not performed as requested during relicensing, it is our determination there will be significant gaps in information and the Applicant will not be able to prepare a complete and adequate Draft License Application.

In our October 12, 2021 PAD comments and study requests[1] MDMR requested the following six studies:

1. Three-Dimensional Computational Fluid Dynamics (CFD) Modeling Upstream and Downstream of the Discharge and in the Vicinity of Powerhouse Forebays
2. Upstream Juvenile Eel Assessment
3. Downstream American Eel Passage Assessment
4. Downstream Passage Alternatives Study
5. Upstream Passage Alternatives Study
6. Evaluation of the Size of American Eels and the Timing of their Downstream Migratory Movements

A recuring theme in the PSP was an inaccurate interpretation of the comments filed by Maine Department of Inland Fisheries and Wildlife (MDIFW) on October 8, 2021.[2] GLHP states, "The Ripogenus and Penobscot Mills Projects are located on the West Branch, and Project waters are currently managed by MDIFW as a resident coldwater sport fishery for landlocked salmon and brook trout. MDIFW has stated that it wants no change to the current upstream fish passage at the Projects to combat the continued spread of invasive species, which are a serious threat to Maine's wild and native

[1] Accession Number: 20211012-5681
[2] Accession Number: 20211008-5293

fisheries. As a result, there are no current plans to create fish passage for anadromous species at the Projects." This conclusion is an intentional misinterpretation of the statements of MDIFW, which MDIFW clarified at the PSP meetings on December 15, 2021 and December 16, 2021.

The 2009 comprehensive management plan states, "American eel, American shad, and Atlantic salmon historically utilized portions of the West Branch Penobscot, but the 10 hydropower and water storage dams on the West Branch Penobscot do not pass diadromous fish and no passage is planned in the near term."[3] While the historic habitat for these species and alewife was identified in the plan, no passaged was planned and no passage measures were supported by the licensee for the Projects. Therefore, there was no path at the time of writing of the 2009 comprehensive plan for restoration of diadromous species to the habitat in the West Branch Penobscot. The absence of upstream passage facilities at the Projects prevents upstream passage for most diadromous species, including sea-lamprey not explicitly mentioned in the plan, and inhibits the passage of American eels. In addition, the lack of downstream passage facilities at the Projects likely have impacts on the survival and injury of American eel and would likely have impacts on other diadromous species.[4] As the Projects are currently undergoing relicensing, MDMR has submitted study requests that will adequately evaluate the effects of the Projects on resources of concern and provide the critical information needed to develop license conditions; including fish passage facilities.

In addition, the comments and study requests of MDMR should not be interpreted as in conflict with the invasive species concerns expressed in MDIFW's comments. Invasive species control will need be a primary goal for the continued operation of the Projects and maintenance of the Project impoundments regardless of fish passage structures at the Projects. While the Project Facilities have created large impoundments that provide foraging habitat for landlocked salmon, impoundments like these are well documented as facilitating the spread of invasive species into the impoundments themselves as well as into connected natural lakes.[5] This invasive species spread includes both flora and fauna. The most common pathway of spread of invasive species is not through fishways but from recreational boat bilges and the most effective approach to prevent invasive species spread is sustained outreach and education.[6] If supported by MDIFW, MDMR would recommend the Projects' licenses include annual support for outreach and monitoring at recreational facilities to prevent the spread of invasive species. Additionally, invasive species control is a common component of operation of fishways. In fact, BREG in their final license application for the Mattaceunk Project (P-2520) stated, "The fishway (with the supplemental attraction water) is typically operated from May through mid-November, and it is voluntarily monitored (through use of the fish trap) on a daily basis for successful Atlantic salmon passage and *to ensure that undesirable species (such as northern pike) are not passed upstream*." (Emphasis added). Similar measures would be expected for any fishways at the Projects to ensure invasive species are not passed upstream into the West Branch Penobscot.

[3] MDMR and MDIFW (2009)
[4] Verreault et al. (2004); Hitt et al. (2012); Turner et al. (2018); Mensinger et al. (2021)
[5] Johnson et al. (2008); Clavero and Hermoso (2010); Bea et al. (2018)
[6] Lodge et al. (2006); Hulme et al. (2008); Cole et al. (2019); Mohit et al. (2021)

**Requested Studies Not Adopted**

*Three-Dimensional Computational Fluid Dynamics (CFD) Modeling Upstream and Downstream of the Discharge and in the Vicinity of Powerhouse Forebays*

MDMR is amenable to delaying this study but disagrees with the timeframe assertions made by GLHA. American eels are present in the West Branch today and will pass the projects each and every season. Defining the specific impacts to eels during their migrations is the explicit purpose of our other study requests. This CFD study would add detail to project specific conditions (I.e. flow velocities in the vicinity of Project facilities) and aide in identifying project areas that likely have impacts (E.g. potential for impingement, potential route of passage based on flow velocities, etc.). In addition, this CFD study would provide information that will be necessary in the development of mitigation measures.

The FERC ILP process specifically outlines the timeline for completion of studies to inform relicensing of projects. GLHA did not include any description of "potential changes in operations or infrastructure, which could occur at one of more of the Projects' developments over the next 15 years" in the PAD. If any such developments are proposed as part of the relicensing process, this study should be delayed incorporating changes at the project, but it should still be completed in time to be available to resources agencies and FERC during their review of the draft license. Any changes to the Projects that take place outside of relicensing would be part of proposed amendments to any future license and should be viewed as separate from this relicensing process with separate review and study requirements.

Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended, Commission staff will prepare an environmental document (NEPA document) which will be used by the Commission to determine whether, and under what conditions, to issue a new license for the Projects. This study request will provide critical information to support and assist the Commission in their environmental review in the NEPA document of the following issues identified in section 4.1.2 Water and Aquatic Resources of Scoping Document 2 (SD2)[7]:

- "Effects of continuing to operate the Projects on aquatic (littoral) habitat for resident and migratory fish and freshwater mussel species (as appropriate) in the project impoundments and project-affected reaches downstream from project dams and powerhouses (e.g., the Upper Gorge, Holbrook Side Channel, West Branch downstream from Stone Dam, and Millinocket Stream)."
- "Effects of project flow diversion and dewatering of the river channel downstream from Ripogenus Dam and Stone Dam on fish populations and movement, aquatic habitat, and river connectivity."
- "Effects of continuing to operate the Projects on upstream and downstream passage of American eels in the West Branch."
- "Effects of continuing to operate the Projects on the movement of sea-run Atlantic salmon and alosines (American shad and river herring) in the West Branch and mainstem Penobscot River."
- "Effects of continuing to operate the Projects on fish impingement, entrainment, and survival at the Projects' developments."

[7] Accession Number: 20211122-3054

- "Effects of continuing to operate the Projects on state-protected aquatic species (e.g., brook floater, yellow lampmussel, and tidewater mucket).[8]"

In addition, this study request will provide critical supporting information to the following issues identified in section 4.1.4 Threatened and Endangered Species of SD2:

- "Effects of continuing to operate and maintain the Projects on: (1) the federally threatened Canada lynx and its designated habitat and northern long-eared bat; and (2) the federally endangered Gulf of Maine Distinct Population Segment Atlantic salmon and its designated critical habitat, including movement, restoration/recovery, and passage."

*Evaluation of the Size of American Eels and the Timing of their Downstream Migratory Movements*

As GLHA stated in the PSP, "Since neither of the two study methodologies outlined above are suitable for the Projects, and since there is already existing information on eel size and timing of out-migration in Maine, GLHA proposes to rely on the existing knowledge base of the timing and sizes of adult eels during downstream migration."

MDMR requests the Commission approve this study as submitted in our October 12, 2021 PAD comments and study requests. The two sources that GLHA references do not provide recent data, un-biased by fishing gear and effort, and inclusive of higher watershed projects. Shepard (2015) does not assess eel migration timing upstream of the West Enfield Project and thus the migration window will need to be modified to adequately project eels migrating from higher watershed projects. Migration must start earlier at projects higher in the watershed to allow time for eels to reach the lower watershed projects, where timing has been documented. As no information has been collected at projects this high in any watersheds in Maine for the purpose of documenting the eel migration window, we have no information to inform how early in the season eels begin their downstream migration or late they continue to into the winter.

In addition, there has been substantial change in conditions since the data used in Shepard (2015) and Haro (2003). The data utilized for both papers was collected prior to the Penobscot Restoration Project, which saw the removal to two dams on the lower river. The Penobscot Restoration Project also saw increasing of flashboard heights and implementation of fish passage measures at several projects including eel fishways. Those eel fishways would affect both the timing and abundance of yellow eels as they migrate upstream. The best available count of the upstream migration of eels after the Penobscot Restoration Project is at the West Enfield Project. Counts of juvenile eels at the West Enfield Project increased from 28 in 2012 to 218,755 in 2020.[9] This information is critical as it will be used to define the timing of protection and mitigation measures for adult eels.

[8] The Maine State Wildlife Action plan identifies: American Eel as Special Concern Species and Tier 2 priority Species of Greatest Conservation Need; Blueback Herring, American Shad, and Atlantic Salmon as Tier 1 priority Species of Greatest Conservation Need; Alewife as Tier 2 Species of Greatest Conservation Need.

[9] Accession Number: 20210401-5539; In addition, thousands of juvenile eels are also known to use the vertical slot fishway at the West Enfield Project in given year but are not included in the estimate.

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http://www.Maine.gov/dmr
PHONE: (207) 624-6550 FAX: (207) 624-6024

GLHA also states that American eel are thought to occur in limited numbers due to the Project's relative location high in the watershed. This statement is intentionally misleading as it does not acknowledge that upstream migration is impacted heavily by the presence of dams in a watershed. On the contrary, Hitt et al. (2012) found that eel density in a headwater stream increased dramatically following dam removal. As is well documented by the counts of eels at West Enfield, eel specific upstream passage dramatically increased the number of eels migrating higher in the watershed. In addition, while eels have been caught incidental to sampling for other species, no studies have been carried out that target eels specifically, so the density of eels is not known at this time. MDMR requests that GLHA conduct the study as we requested.

GLHA also expressed their concern over the study methodologies but they should note that similar methodologies have been used at other hydroelectric projects in the Northeast. To further bolster the traditional field approach we requested in our October 12, 2021 filing, MDMR has developed an additional eDNA study component that will ensure that study efforts result in data that is reflective of the resource and can be used to address issues raised by the Commission. To that end, MDMR requests that GLHA carryout an eel eDNA study that would require collection of water samples at designated sites, agreed upon by the resource agencies, in the impoundment and tailwater of each dam within the Projects. Recent studies have identified eDNA as a very effective tool in eel assessment.[10] Water samples should be collected after dark, daily, for the duration of the downstream migration season. Additional samples should be taken at a reference site where adult eel presence is known and well documented. Finally, additional eDNA samples will need to be collected periodically outside of the adult eel migration season defined in Shepard (2015) at the designated sites. These out-of-season samples will inform background eel eDNA levels and will allow in-season samples to be compared against a benchmark for each sampling location. It is important to note that an eDNA approach would provide timing and abundance (relative, not population abundance) information, but would not document the size of eels. Therefore, we are not recommending eDNA as a standalone approach.

This information is critical as it will be used to define timing of type of protection and mitigation measures for downstream migrating adult eels. As indicated by GLHA in the PAD and at the PSP meeting, eels are present upstream of the Project facilities. None of the Project facilities currently have structures or operations to protect downstream migrating adult eels. This study, as requested and unmodified, will result in critical information that will be used to 1) assess any potential impacts to project operations; and 2) develop adequate protection measures.

Pursuant to the NEPA of 1969, as amended, Commission staff will prepare a NEPA document which will be used by the Commission to determine whether, and under what conditions, to issue a new license for the Projects. This study request will provide critical information to support and assist the Commission in their environmental review in the NEPA document of the following issues identified in section 4.1.2 Water and Aquatic Resources of SD2:

- "Effects of continuing to operate the Projects on aquatic (littoral) habitat for resident and migratory fish and freshwater mussel species (as appropriate) in the project impoundments and

[10] Itakura et al. (2019); Cardás et al. (2019); Chin et al (2021)

project-affected reaches downstream from project dams and powerhouses (e.g., the Upper Gorge, Holbrook Side Channel, West Branch downstream from Stone Dam, and Millinocket Stream)."

- "Effects of project flow diversion and dewatering of the river channel downstream from Ripogenus Dam and Stone Dam on fish populations and movement, aquatic habitat, and river connectivity."
- "Effects of continuing to operate the Projects on upstream and downstream passage of American eels in the West Branch."
- "Effects of continuing to operate the Projects on the movement of sea-run Atlantic salmon and alosines (American shad and river herring) in the West Branch and mainstem Penobscot River."
- "Effects of continuing to operate the Projects on fish impingement, entrainment, and survival at the Projects' developments."
- "Effects of continuing to operate the Projects on state-protected aquatic species (e.g., brook floater, yellow lampmussel, and tidewater mucket).[11]"

*Downstream Passage Alternatives Study*

Note, GLHA separated the study request of MDMR for Downstream Passage alternatives into two study requests in the PSP, one for American Eels and a second for all other diadromous species, and rejected both. GLHA includes many false statements and conclusions in their rejection of these studies, which GLHA included in the rejection of other studies requested by MDMR. Please refer to our general comments in this filing for corrections of these false statements and conclusions. Regarding the Downstream Passage Alternatives Study, MDMR provides no additional comments.

*Upstream Passage Alternatives Study*

GLHA includes many false statements and conclusions in their rejection of these studies, which GLHA included in the rejection of other studies requested by MDMR. Please refer to our general comments in this filing for corrections of these false statements and conclusions. Regarding the Upstream Passage Alternatives Study, MDMR provides no additional comments.

**Study Requests Adopted With Modification**

*Upstream Juvenile Eel Assessment*

MDMR requests the Commission approve this study as submitted in our October 12, 2021 PAD comments and study requests. GLHA proposes in the PSP to conduct the study at the East Millinocket development, but not conduct the study at the remaining Projects' developments. In addition, GLHA has modified the goal of the study to, "assess **whether** American eel are found in or near the East Millinocket tailwater area, congregate at or near the base of the East Millinocket dam, or attempt to migrate upstream over the East Millinocket dam. GLHA will collect information regarding the timing of

[11] The Maine State Wildlife Action plan identifies: American Eel as Special Concern Species and Tier 2 priority Species of Greatest Conservation Need; Blueback Herring, American Shad, and Atlantic Salmon as Tier 1 priority Species of Greatest Conservation Need; Alewife as Tier 2 Species of Greatest Conservation Need.

movements, behavior, and the approximate size of juvenile American eel if they are present at the East Millinocket development."

As indicated in the PAD, "American eel have been found in each of the Project impoundments." In fact, American eel were documented as part of the fish assemblage catches from the previous relicensing of the Project.[12] Dams, such as East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, and the Ripogenus dam, are known to impair migration success for catadromous species such as American eel.[13] However, in the intervening years there have been no upstream or downstream passage facilities or operational measures installed or implemented at any of the Project facilities.

As noted in the 2009 Strategic Plan[14], the first project in Maine with a fish passage requirement for American eel was the Medway Project. The Medway Project (P-2666) is the first dam on the West Branch Penobscot. At the time of writing, the 2009 Strategic Plan included the following text related to eel passage in the Penobscot River, "Construction of upstream eel passage and implementation of downstream passage measures at Penobscot River projects should enhance eel abundance in the Penobscot basin, and increase escapement of pre-spawning adults to the ocean."

As MDMR stated in our October 12, 2021 PAD comments and study requests, the goal of this study is to assess the locations for dedicated upstream passage for American eel. The study has two objectives:

1. Conduct systematic surveys of eel presence/abundance below the East Millinocket Development, Dolby Development, Millinocket Development, North Twin Development, Millinocket Lake Storage Development, and the Ripogenus dam to identify areas of concentration of eels staging in pools or attempting to ascend wetted structures that would potentially establish the most effective location to place upstream eel passage facilities.
2. Collect eels with temporary trap/pass devices at areas identified from surveys as potential location of eel concentrations to assess whether eels can be collected/passed in substantial numbers, and whether locations are viable sites for permanent eel trap/pass structures.

Pursuant to the NEPA of 1969, as amended, Commission staff will prepare a NEPA document which will be used by the Commission to determine whether, and under what conditions, to issue a new license for the Projects. This study request will provide critical information to support and assist the Commission in their environmental review in the NEPA document of the following issues identified in section 4.1.2 Water and Aquatic Resources of SD2:

- "Effects of continuing to operate the Projects on aquatic (littoral) habitat for resident and migratory fish and freshwater mussel species (as appropriate) in the project impoundments and project-affected reaches downstream from project dams and powerhouses (e.g., the Upper Gorge, Holbrook Side Channel, West Branch downstream from Stone Dam, and Millinocket Stream)."

[12] Federal Energy Regulatory Commission (FERC). 1996. Final Environmental Impact Statement Upper Penobscot River Basin Maine, Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458). Federal Energy Regulatory Commission, Public Reference and Files Maintenance Branch, Washington, DC.
[13] ASMFC (2014)
[14] MDMR and MDIFW (2009)

- "Effects of project flow diversion and dewatering of the river channel downstream from Ripogenus Dam and Stone Dam on fish populations and movement, aquatic habitat, and river connectivity."
- "Effects of continuing to operate the Projects on upstream and downstream passage of American eels in the West Branch."
- "Effects of continuing to operate the Projects on the movement of sea-run Atlantic salmon and alosines (American shad and river herring) in the West Branch and mainstem Penobscot River."
- "Effects of continuing to operate the Projects on fish impingement, entrainment, and survival at the Projects' developments."
- "Effects of continuing to operate the Projects on state-protected aquatic species (e.g., brook floater, yellow lampmussel, and tidewater mucket).[15]"

Finally, MDMR disagrees with GLHA's statement, "Such passive measures have a low chance of being successful given the expected low density of juvenile American eel in the Project area." Passive methods that are applied in tandem with active survey methods compliment the active surveys, which by design sub-sample temporally and therefore have the potential to miss eels. The two types of assessment together represent a methodology that ensures appropriate temporal and geographic coverage. In contrast the methods proposed by GLHA, specifically electrofishing for one night in June and one night in August, are an inadequate approach that will likely not provide useful information for the licensing process.

At the PSP meeting, a member of the Commission asked about the effectiveness of using traps/pots as a sampling method for American eel. MDMR currently conducts a fishery independent life cycle survey covering glass, yellow, and silver eels each year.[16] This survey relies on the use of a ramp and pot capture system for glass and yellow eels migrating upstream and a separate pot only approach for yellow eels in a pond. This approach is similar to those described by Turner et al. (2018).

*Downstream American Eel Passage Assessment*

MDMR requests the Commission approve this study as submitted in our October 12, 2021 PAD comments and study requests. A desktop study approach is an inappropriate modification because a desktop study approach will only provide a minimum estimate of mortality and is highly reliant on project specific inputs. In the PSP GLHA states, "In lieu of conducting a large-scale, comprehensive field assessment, GLHA proposes to examine the question regarding potential effects of downstream passage on adult American eel at each of the Projects' developments through a desktop assessment." A desktop study approach will not provide any information about route of passage related to Protect operations, injury, delay, or cumulative impacts of passing the four dams and the Millinocket Development Gatehouse that comprise the Projects' facilities. The Applicant has not provided any information, and none is publicly available, to address these data gaps. In addition, a desktop study will

[15] The Maine State Wildlife Action plan identifies: American Eel as Special Concern Species and Tier 2 priority Species of Greatest Conservation Need; Blueback Herring, American Shad, and Atlantic Salmon as Tier 1 priority Species of Greatest Conservation Need; Alewife as Tier 2 Species of Greatest Conservation Need.
[16] ASMFC (2021)

not identify project specific infrastructure (E.g. weirs, gates, routes clogged with debris, etc.) with high impacts on American eels. Given that the project facilities have wide spaced trash racks and no fish guidance structures, we assume that most eels in the watershed pass the project dams through the turbines and have the potential to high injury and mortality rates by current operations and infrastructure at the project facilities. Some of the projects also have concrete curtains below their spillways, which could also injure or kill downstream migrating eels.

High survival for downstream migrating eels is critical for the species. Recent studies have shown that poor downstream passage can be detrimental to an eel population and serve as an ecological trap.[17] MDMR requests that GLHA perform the Downstream American Eel Passage Assessment as requested. This information is necessary to determine the effects of Project operations on the American eel within the West Branch Penobscot and the subsequent development of any terms and conditions for this licensing proceeding. In addition, Pursuant to the NEPA of 1969, as amended, Commission staff will prepare a NEPA document which will be used by the Commission to determine whether, and under what conditions, to issue a new license for the Projects. This study request will provide critical information to support and assist the Commission in their environmental review in the NEPA document of the following issues identified in section 4.1.2 Water and Aquatic Resources of SD2:

- "Effects of project flow diversion and dewatering of the river channel downstream from Ripogenus Dam and Stone Dam on fish populations and movement, aquatic habitat, and river connectivity."
- "Effects of continuing to operate the Projects on upstream and downstream passage of American eels in the West Branch."

If a Turbine Blade Strike Analysis (TBSA) is included as part of this assessment, MDMR requests that all inputs for the TBSA be reviewed and approved by MDMR and other resource stakeholders before the studies are performed.

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OFFICES AT 32 BLOSSOM LANE, MARQUARDT BUILDING, AUGUSTA, MAINE
http://www.Maine.gov/dmr
PHONE: (207) 624-6550 FAX: (207) 624-6024

**PENOBSCOT NATION**

DEPARTMENT OF
NATURAL RESOURCES

Charlie Loring Jr., DIRECTOR

12 WABANAKI WAY
INDIAN ISLAND, ME 04468
TEL: 207/827/7776
FAX: 207/817/7466

Kimberly D. Bose, Secretary

February 22th, 2022

Federal Energy Regulatory Commission

888 First Street, NE,

Washington, D.C. 20426

**RE: Penobscot Mills (P-2458-247) and Ripogenus (P- 2572-133) Proposed Study Plan**

Dear Secretary Bose,

The Proposed Study Plan (PSP) for the Ripogenus Hydroelectric Project (FERC NO. 2572) and the Penobscot Mills Hydroelectric Project (FERC NO. 2458), drafted by Great Lakes Hydro America, LLC (licensee) on November 22, 2021 has been reviewed by the Penobscot Indian Nation (PIN). The PIN has been an active participant for these important relicensing events and looks forward to continued consultation with the Federal Energy Regulatory Commission (FERC) and the licensee for purposes of minimizing the negative social, economic and environmental impacts of these private projects on the public resources in the West Branch of the Penobscot River.

**Background:**

The Penobscot Nation has inhabited the Penobscot River, including the West and East Branches, from time immemorial. This is the Nation's aboriginal domain. The Nation has never ceded its related aboriginal title to the River and its branches in any treaty and Congress has never extinguished that aboriginal title**.** It is the Nation's position that the Ripogenus and the Penobscot Mills Projects, located on the West Branch of the Penobscot River, occupy federal lands, the Penobscot Reservation.

**Socioeconomics Study Request:**

The PIN drafted and submitted comments on the Pre-Application Document (PAD) on October 12th, 2021, complete with a Socioeconomics Study request. Within these comments, the PIN identified the significant data gaps in Section 5.1 of that document. The socioeconomic conditions in the region were not adequately addressed and large portions of the history of the projects, their integral role in the papermaking industry and the extreme changes to employment in the region since the last relicensing, were not addressed. Great Northern Paper, (GNP) former owner and builder of the dams, was not even mentioned in the PAD. The PIN provided much of this history in its' PAD comments and outlined the need for a more robust analysis of the socioeconomic conditions in the region and how the potential relicensing of these projects could affect the regional socioeconomic conditions. The PIN drafted a study request to meet this unmet need.

Scoping Document #2 (SD2), released by the FERC in November of 2021, outlines the information required to complete their analysis according to the National Environmental Policy Act of 1969 (NEPA document). In line with the Electric

Consumers Protection Act (ECPA) of 1986, the FERC is required to give equal consideration of both power and non-power uses of the resource, in this case, the West Branch of the Penobscot River. The NEPA requires that the FERC independently evaluate the social, economic and environmental effects of relicensing the projects as proposed and consider reasonable alternatives to the proposed actions. The FERC's Scoping process helps to determine the required level of analysis and satisfy the NEPA scoping requirements.

The licensee conducted a PSP Public meeting on December 12th, 2021. During that meeting, the licensee outlined its reasons for not adopting the Socioeconomic Study as proposed by the PIN. At that time, attorney Allison Economy, representing camp owners within the projects area, vocalized support for such a study and requested it include addressing the needs of the camp owners she represents. This sentiment was echoed by other Non-Governmental Organizations (NGO). ***Additionally, FERC Outdoor Recreation Planner, Dustin Wilson, expressed support for a robust socioeconomic study in order that FERC have complete information to conduct their NEPA analysis.***

The PIN has attached an updated Socioeconomics Study request to fulfill the needs of the FERC study proposal guidelines. The study request, complete with additions asked for by the licensee, is attached at the end of this document.

**The FERC's Additional Information Request (AIR)**

The FERC made an AIR on October 8th, 2021. The FERC letter states:

> "*Therefore, please include, as an appendix to the Proposed Study Plan, 10 years of operations data (in excel format) for each project, or each individual development, in the case of the Penobscot Mills Project, including: (1) daily impoundment elevations; and (2) daily outflows (minimum, maximum, and average discharges).*"

This request is similar to request made by numerous stakeholders during the Scoping process. The PIN requested the exact information in its letter dated September 13th, 2021. As stated by the FERC in their letter dated September 28th, 2021,

> "*Following the scoping meetings, several stakeholders filed letters requesting: (1) additional information from Great Lakes Hydro America (GLHA) and Commission staff; (2) an extension of time to file comments on the Preliminary Application Document (PAD) and study requests; and (3) an additional public scoping meeting. These stakeholders included the* ***National Marine Fisheries Service*** *(NMFS; September 13, 2021); the* ***U.S. Fish and Wildlife Service*** *(FWS; September 14, 2021); the* ***Penobscot Indian Nation*** *(PIN) and the Maine Council of Trout Unlimited (Maine Council TU), both on September 16, 2021; and the Maine* ***Department of Marine Resources*** *(Maine DMR) and* ***Maine Department of Inland Fisheries and Wildlife*** *(Maine DIFW), both on September 17, 2021*".

The FERC denied the extension requests in order to keep the relicensing on schedule, and submitted their AIR in order to ensure adherence to the proposed schedule. The FERC stated in their letter dated September 28th, 2021 that,

> "*Because the established milestones are designed to prevent undue delay in the relicensing process, and the timing of the field seasons would be negatively affected by a 90-day delay in the process, the stakeholders' request for a 90-day extension of time to file comments on the PAD and study requests is denied*".

To date, the licensee has only supplied **e**xcuses for why this information is not being made available to the FERC and stakeholders and stated in the PSP that the information would be gathered as part of a study, to be made available at the end of the first year of studies. The Historical Operations Data and Assessment Study Plan is proposed in the PSP to be completed in 2022, with the report being made available in April of 2023.

> "*GLHA proposes to perform this study in 2022, with study results provided in the Initial Study Report to be filed with FERC in April 2023*".

The PIN finds this schedule to be extremely problematic. The information requested by the agencies, numerous NGO stakeholders and the FERC is critical in understanding the operations and impact of such operations on the public resources of the West Branch of the Penobscot River.

The PIN is confused as to why this data is challenging to provide. As an operator of these facilities for over decade, operational data for past and present operations should be part of the normal management of these facilities by the licensee/operators. The narrative created by the licensee, where multiple contractors and licensee staff is incapable of assembling such data in a timely manner, is absurd and disrespectful to the process and the stakeholders. The PAD was filed in June of 2021. The licensee has had adequate time to assemble and distribute the required information.

The PIN respectfully requests that the FERC intervene in this process and amend the relicensing schedule to reflect the licensee's unwillingness to provide this essential, baseline information. The shifting of the information request into a Study Proposal is unacceptable to the PIN and is undermining the relicensing designed to include stakeholder input into the Scoping process. The PIN is confused as to how the Scoping process can be completed, when the most basic and necessary of information is still being withheld from all stakeholders, to include the FERC.

The PIN is hopeful that the FERC will demand this information be supplied to stakeholders immediately and that the intentional game of obfuscate and delay being practiced by the licensee can come to a much needed end.

**Comments on Studies Proposed in the PSP—**

1) The licensee identifies the accuracy of handheld YSI ProSolo dissolved oxygen meters that are being used for studies of trophic status. However, there is very little information provided about the continuous monitoring sondes that will be used for the downstream temperature and dissolved oxygen assessment work, other than indicating an Onset HOBO data logger (or similar) will be used.

   *The* licensee *should state the accuracy of the loggers that they will use to ensure that they meet Maine DEP's accuracy requirement of 0.2 mg/L.*

2) *We recommend that the DO/Temperature loggers be equipped with sensor wipers to prevent biofouling of the probe, which is likely to occur during the deployment periods*.

3) Table 3 of Appendix A-10 provides the detection limits for impoundment trophic sampling. The detection limits listed from the HETL laboratory for several parameters are higher than the required Maine DEP reporting level/detection limits.

   *The* licensee *should work with their selected laboratory or select a different laboratory that will provide them with detection limits that meet those of Maine DEP.*

4) *Based on PIN experiences at Dolby Pond, we believe that the licensee should use at least 2 sites within the Dolby Impoundment for the trophic status study. In addition to the site displayed on map in Figure 5 of Appendix A-25, immediately upstream of the Dolby Dam, the applicant should also sample in the deep hole located in the North East portion of the impoundment. Water quality conditions between these two deep water areas can vary substantially and both are affected by the operation of the Dolby Dam.*

5) PIN disagrees with the licensee's assertion that riverine aquatic habitat cross-sectional flow studies are not needed below the McKay Station, Millinocket powerhouse, Dolby Dam, or the East Millinocket dams.

   *These studies are indeed needed to demonstrate that the projects attain aquatic habitat for fish and aquatic life within these areas. While the licensee claims studying these areas is unnecessary, the PIN is unable to evaluate whether water quality standards will be attained without the information from conducting these studies.*

6) PIN disagrees with the licensee's decision to not adopt proposed studies by NMFS including 1) Study to Evaluate the Effects of Operating the Penobscot Mills and Ripogenus Dams on the Hydrology of the West Branch and Mainsteam Penobscot River Using Indicators of Hydrologic Alteration Model; 2) Study to Evaluate Project River Temperature in West Branch and Mainstem Penobscot River; 3) Study to Evaluate Future Flow and Water Temperature Scenarios.

   *The PIN believes that these are important studies that are needed to evaluate how the proposed operation of these dams affects the flows and water temperature within and downstream of the project areas. These large projects must be evaluated in the context of the watershed which they exist and effect.*

**USFWS comments on the PSP:**

The PIN would like to express its support and concurrence for the USFWS comments submitted on February 22, 2022. The PIN has worked collaboratively with the USFWS throughout this relicensing and will continue to support the goals of the USFWS for this important relicensing.

Please reach out at any time if there are questions or any clarification needed for these comments.

Sincerely,

Daniel McCaw

Fisheries Program Manager
Penobscot Indian Nation
Indian Island, Maine

**Appendix 1. Penobscot Indian Nations' Socioeconomics Study proposal**

**Socioeconomics Study**

*§5.9(b)(1) –* ***Describe the goals and objectives of each study proposal and the information to be obtained.***

The goals of the study would be to describe the existing socioeconomic environment in the study area, including population, housing, economic development, public services, local energy production, State of Maine statues for energy production in the future, fiscal conditions, and infrastructure. The effects of project relicensing on the local and regional socioeconomic conditions will need to be evaluated in order for the FERC to adequately understand project effects on local resources, to include water quality, fish and wildlife, cultural, recreation, aesthetics, land use, and tribal resources.

The study would describe socioeconomic resource trends under the existing condition, summarize the existing condition of the recreation resources in the study area and describe the current Project and social and environmental measures as they relate to the socioeconomic factors. The study should also include extensive input from stakeholders to determine the priorities for future use of the resources described previously.

The study would also describe changes in employment or income associated with modifications to recreational potential for the river in existing and no-dam conditions. The study would describe the current socioeconomic condition of the Maine Tribes and identify socioeconomic issues and concerns.

The study would also serve as a source of information in considering other options for the projects, to include altered operational regimes to better suit recreational activities such as fishing, guiding and whitewater rafting. License orders could be based on the needs of local stakeholders, as operation of the projects is no longer tied to the defunct papermaking industry for which the dams were first built and last relicensed. Decommissioning and removal of some or all of the projects, for instance, may better suit a local economy based on tourism and multiple uses.

To understand incremental Project effects on socioeconomic resources, it is important first to characterize the existing population demographics, local human resources and public services, the local and tribal economy, as well as pertinent trends in such factors. It will be necessary to identify the study area in terms of the geographic extent of the potential incremental Project's sphere of influence on the socioeconomic condition as well as to identify likely differences across regions in the types of socioeconomic factor effects. The existing information is used to identify current socioeconomic conditions and expected trends in the study area. This is one of many reasons a Working group should be established: to define these parameters for the study.

The results of this study will provide information to satisfy FERC license application requirements specific to Project-related effects on the socioeconomic environment as specified in the applicable sections of 18 CFR Parts 4 and 16.

*§5.9(b)(2) –* ***If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.***

The PIN has concerns that the West Branch of the Penobscot River, a public resource of the highest value to the Tribe is being negatively impacted by the continued operation of the projects. Ecological integrity of the system is impossible in a river where the majority high-gradient habitat is flooded by the projects and the riverine stretches in between the projects are impaired by peaking operations. Traditional cultural practices are unable to be exercised because of the extreme modification and industrialization of this public resource called the West Branch of the Penobscot River. The PIN believes that a large scale, comprehensive socioeconomics study is needed to understand these issues and the effects of projects operations on these resources concerns. This information will be needed by the FERC in order complete their analysis of project effects and would inform the development of license conditions needed to protect and enhance resources identified by local stakeholders.

Specific issues of concerns for the PIN include:

a) Lack of fish passage and turbine exclusion measures for diadromous and native species in their historic range. Numerous species remain extirpated from the West Branch due to the lack of structures and are unavailable for Tribal sustenance and regional recreational opportunities.

b) Access to historically important sites for cultural and sustenance uses, many of which are unavailable due to the project impoundments and operations. Cultural and recreational opportunities are unavailable in the project areas due to the presence of the projects, their impoundments and peaking operations.

c) Recreational activities such as fishing, boating, camping, birding, and ecotourism, to name but a few, are greatly hindered by the projects and their operations. The local economy is negatively affected by the continued negative projects effects and no longer receive any positive gain from the projects. The local economy will be based on ecotourism and outdoor adventures as the region adapts to the loss of the GNP paper mills once powered by these projects.

d) The negative effects of peaking flow manipulation on the social, economic, cultural and recreational opportunities on the West Branch of the Penobscot River.

*§5.9(b)(3) –* ***If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.***

The requestor is a Federally-Recognized Indian Tribe, the Penobscot Indian Nation.

*§5.9(b)(4) –* ***Describe the existing information concerning the subject of the study proposal, and the need for additional information.***

The PIN knows of no such study or data available, with the exception of the population and census data contained within the PAD. The current socioeconomic conditions of the region are dramatically different when compared to the last licensing period. The local papermaking mills have all been closed and the power from the projects does not support the entire region through its connection to the mills. The potential for multiple uses of the West Branch of the Penobscot River exists. Historically, the local community and the State of Maine government let the public resources of the West Branch of the Penobscot River be utilized for the benefit of the local mills which supported the entire local economy. The local communities no longer receive any public benefit from the projects and the needs of the local economies are no longer supported by the projects. However, no information exists on the cultural, economic and recreational activities that are affected by the projects, or the opportunities that could be realized if some or all of the projects were decommissioned and removed. Alternative operations and protective structures at the projects need to be evaluated against the local socioeconomic conditions and needs. The information gathered by an extensive socioeconomics study will be needed by the FERC to complete their analysis of project effects and will help determine future license conditions needed to protect and enhance the local socioeconomic conditions, if the projects are relicensed.

§5.9(b)(5) ***Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.***

The connections between the project, project operations and the socioeconomic conditions in the local region are extensive. The Great Northern Paper (GNP) Company was founded in the late 1800's. The company created the "Magic City" in the north Maine woods where no organized town had been before. GNP contracted for homes, tenements and even a hotel to be built in the city to supply housing for workers at the mills. (http://greatnorthernpaperhistory.com/the-paper-giant/millinocket-grows.html) GNP built and maintained the Penobscot Mills and Ripogenus projects specifically to provide energy to their mills and to provide an economic advantage over its competitors. It was the first paper mill to have an electrical generation and distribution facility built into the plant. (https://en.wikipedia.org/wiki/Great_Northern_Paper_Company) In the 1940's the timberland owned by GNP had grown to over 5 million acres. In 1977 GNP was still Maine's second largest private employer after Bath Iron Works. At one time GNP's was the nation's largest industrial hydro-electric system, producing enough power to electrify a city of 450,000 or, comparably, almost half the homes in Maine. (https://damnyankee.com/great-northern-paper)

The projects have multiple connections to the local socioeconomics. Cultural, outdoor and economic opportunities are linked to the management of the West Branch of the Penobscot River. The West Branch of the Penobscot River is highly modified by the projects and flows are managed in a peaking mode in order to maximize profits for the licensee. The River is affected by the projects and project operation not only in the projects areas, but also throughout the region and Penobscot River drainage. Fish populations are diminished to historically low numbers, riverine reaches have been flooded and highly managed for flows, and Tribal cultural traditions, to include sustenance fishing, are all negatively

impacted by the projects and project operations. Future license orders should be based on the extensive information this study will provide.

*§5.9(b)(6)* ***Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.***

There are many methodologies used by professionals and researchers to describe socioeconomic conditions in a region. Regional economic modelling can be accomplished using economic input-output models (i.e., IMPLAN, JEDI) or through computable general equilibrium (CGE) models.

IMPLAN is a proprietary software that is the industry standard for economic impact assessment and regional economic modeling. CGE is becoming more popular in academic literature. IMPLAN was originally developed and is now maintained by the Minnesota IMPLAN Group (MIG). It models monetary flows through major sectors of the specific region's economy through a set of extensive economic databases, region-specific multipliers (local, state, national), demographic statistics, and highly refined quantitative analysis. IMPLAN allows the user to develop local-level input-output models that can estimate the economic impact (local spending, jobs, tax revenue, etc.) of new firms moving into an area as well as the impacts of professional sports teams, recreation and tourism, and residential development. The model accomplishes this by identifying direct impacts by sector, then developing a set of indirect and induced impacts by sector through the use of industry-specific multipliers, local purchase coefficients, income-to-output ratios, and other factors and relationships. IMPLAN has been used by numerous entities, to include, the U.S. Dept. of Interior, the United States Fish and Wildlife service (USFWS), the State of Maine, and countless others.

The Jobs and Economic Development Impact (JEDI) models developed by the National Renewable Energy Laboratory (NREL) includes a freely available hydropower-specific economic impact model that uses a similar "input-output" modeling approach as IMPLAN but with hydropower-specific inputs and characteristics. In addition to these industry standards in economic impact assessment, other types of socio-economic modeling can be accomplished via hedonic pricing, contingent valuation, willingness-to-pay, and social cost of carbon studies that are very common in economic research and practice.

The PIN recommends a working group be formed to help identify the specific socio-economic parameters that should be included in the study (i.e., jobs, local spending, tax revenue, property values, greenhouse gas emissions reduction, etc.) and the specific methodologies most appropriate to each parameter. There are several professors of economics at the University of Maine who could help advise a working group like this on the most appropriate methodologies depending on the output sought. At a minimum, the socio-economic analysis could begin by replicating with updated data the analysis that was completed for the previous relicensing.

*§5.9(b)(7) –* ***Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.***

Cost and effort would depend on the number of alternatives included in the analysis and the amount of existing information. We anticipate that most or all of the information needed for this analysis already exists, however the information would need to be analyzed and findings to be drafted. A potential cost of $20,000 to $80,000 may be reasonable for such an extensive analysis. This study will require several months to two years of effort to complete. The licensee did not propose any alternative studies.

# United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Maine-New Hampshire Fish and Wildlife Service Complex
Ecological Services
Maine Field Office
P.O. Box A
306 Hatchery Road
East Orland, Maine 04431
207/469-7300 Fax: 207/902-1588

February 22, 2022

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

**RE: Proposed Study Plan Comments for the Ripogenus (FERC No. 2572-133) and Penobscot Mills (FERC No. 2458-247) Hydroelectric Projects**

Dear Secretary Bose:

This is the United States Fish and Wildlife Service's (Service) response to the Proposed Study Plan (PSP) for the Ripogenus and Penobscot Mills Hydroelectric Projects (collectively referred to as Projects), located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot Counties, Maine. The PSP was submitted by Great Lakes Hydro America, LLC (GLHA; Applicant) on November 23, 2021. Subsequently, on December 15, 2021, and December 16, 2021, GLHA held virtual meetings to discuss the contents of the PSP and solicit stakeholder feedback during which the Service, and other parties, provided verbal comments and recommendations. After reviewing the PSP further, and attending the December meetings, the Service has the following comments.

## COMMENTS

General

On October 7, 2021, the Service submitted Pre-Application Document (PAD) comments and study requests for the Projects. In our PAD comment letter, the Service requested GLHA provide stakeholders with operational data (daily minimum, maximum, and average) for the last ten years, at all six developments, to understand how each facility is operated and how operations might affect the hydrology in the West Branch and mainstem Penobscot River. On October 8, 2021, the Federal Energy Regulatory Commission (Commission) issued staff comments on the PAD as well as an Additional Information Request (AIR) for detailed operations data to clarify

how the Projects are operated daily.[1] Specifically, the Commission requested GLHA include, as an appendix to the PSP, 10 years of operations data for each project, or each individual development, in the case of the Penobscot Mills Project, including (1) daily impoundment elevations; and (2) daily outflows (minimum, maximum, and average discharges). However, the requested data has not been provided to date.

> **Service recommendation:** During the PSP meetings, GLHA informed stakeholders, and the Commission, that it will provide the requested operations data as part of the proposed *Historic Operations Data and Assessment* study. However, said data are needed to understand current operations of the Projects, to inform the proposed studies, and the data should have informed stakeholders' responses to the PSP. Therefore, the Service requests GLHA provide the operations data for the Projects, as required in the Commission's October AIR, within 14 days of this correspondence.

GLHA states, "In regard to the Commission's fourth study criteria (i.e., §5.9(b)(4)), there is an extensive amount of information that was collected as part of the previous relicensing proceedings, which was a significant undertaking that studied and modified many aspects of the Projects' original licenses." However, the last relicensing proceeding, and associated studies, occurred when the operating regime was entirely different than it is currently, most notably the loss of the two paper mills for which the previous operating regime was designed to power.[2] Therefore, information, using the best and most updated methodology is needed to understand (1) the current operating regime at all six projects; (2) and how that operating regime might be affecting fish and wildlife within each project area.[3]

Additionally, GLHA states, "GLHA is proposing the studies that meets the criteria and are believed to be required for FERC to perform its environmental analysis for MDEP to issue the Projects' Section 401 Water Quality Certificates, and for FERC to develop the license requirements under which the Projects will operate for the term of the Projects' New Licenses." The Service notes, each study we submitted for this proceeding has been previously approved by the Commission during other hydroelectric dam relicensings in our region, which spans 14 states. Therefore, it is inaccurate to say that any of our studies do not meet the study criteria as outlined by the Commission. Additionally, it is important to note that the studies being proposed by the Applicant will not fully address several environmental issues that the Commission clearly identified in its November 22, 2021, Scoping Document 2 (SD2) as described throughout this letter, below.[4]

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[1] Accession No. 20211008-3060

[2] As indicated in Volume 1 of the PAD, and the National Marine Fisheries Service's October 8, 2021 PAD comment letter (Accession No. 20211008-5254), during the previous relicensings of the Projects, a Water Use Plan (WUP) was developed which identified proposed operations of the Projects that intended to balance and manage multiple competing water uses (e.g., power generation, recreation, fisheries, minimum flows, flood control). Inherent to the WUP model was the goal to maximize energy production for two, now defunct, paper mills in the towns of Millinocket and East Millinocket. These paper mills closed in the mid 2000's. Since power generated at the Penobscot Mills and Ripogenus is no longer used exclusively by the Millinocket and East Millinocket paper mills but is instead used to maximize generation output, past assumptions on water use at the Projects are no longer relevant to current operations.

[3] This is more thoroughly described in the Maine Council Trout Unlimited's February 10, 2022, filing (Accession No. 20220210-5189).

[4] See pages 41 to 45 of SD2.

Studies Not Adopted

*3D Computational Fluid Dynamics Modeling Upstream and Downstream of the Discharge and in Vicinity of Powerhouse Forebays*

GLHA states, "GLHA believes that such a study is unnecessary and contrary to the MDIFW position of no change to the current upstream fish passage at the Projects to combat the continued spread of invasive species, which are a serious threat to Maine's wild and native species." However, during the PSP meetings, the Maine Department of Inland Fisheries and Wildlife (MDIFW) stated that it wasn't its intention to preclude diadromous fish from the West Branch but rather that invasive species management should be included in any fishway that may be implemented as a result of this licensing proceeding.

Further, GLHA states, "The requested CFD study would be best utilized as a tool to support the design phase of any upstream or downstream fish passage facility designs at the Penobscot Mills and Ripogenus Projects at a point in time when passage of anadromous fish species into the West Branch is occurring and reasonable management goals for anadromous fish species in the West Branch have been defined and agreed to among the state and federal resource agencies. Given this uncertainty, as well as potential changes in operations or infrastructure, which could occur at one of more of the Projects' developments over the next 15 years, the development of CFD models as requested are premature at this time."

> **Service recommendation:** The Service is amendable to delaying this modeling effort until the second study season; however, in the first study season GLHA should collect bathymetry data in each headpond (information necessary to develop the model). The requested CFD study will aid in the decision-making process related to mitigation measures at each development. For example, if the requested downstream eel studies show eels predominantly emigrate past one of the dams via the turbines and those eels have a high rate of mortality, the CFD will allow the Service to determine the angle of downstream racks that will achieve the optimal sweeping velocity to ensure safe, timely, and effective passage. Therefore, the Service recommends the Commission require the CFD study as part of this licensing proceeding.

*Evaluation of American Eel Size and Timing of Downstream Migratory Movements*

GLHA states, "Based on the expected low densities of American eel upstream of the Projects, it is unlikely that a sub-sample of nights during the anticipated downstream migration period would yield an adequate sample size from which to inform on timing and population size distribution. The use of an active sampling approach would need to be robust, requiring a significant amount of labor and incurring a large study cost for likely minimal information about eels at the Projects. Nor is an acoustic approach to sampling likely to be effective. GLHA evaluated the potential use of an acoustic approach to evaluate eel size and migratory movement at the Projects. Haro et al. (1999) noted several challenges with acoustic enumeration…"

Further, GLHA states, "Since neither of the two study methodologies outlined above are suitable for the Projects, and since there is already existing information on eel size and timing of out-migration in Maine, GLHA proposes to rely on the existing knowledge base of the timing and sizes of adult eels during downstream migration. Haro et al. (2003) characterizes the run timing of out-migrating American eels in Maine as occurring from early September to early November, with the peak occurring during September 15 and October 15. Shepard (2015), the most recent USFWS status review for the species, stated that eel migration in Maine occurs from August through October with peak passage in response to high river flows."

**Service recommendation:** While GLHA states that this study would be difficult to perform due to the methodologies proposed by stakeholders, said methodologies have been used by other applicants at hydroelectric dams throughout our region, which spans 14 states. Additionally, as stated during the PSP meetings, updated information regarding eel emigration timing in Maine is needed. The dates of emigration of silver-phase American eel (*Anguilla rostrata*) presented in Haro (2003) were compiled (1) from historic literature published prior to 1989; and (2) from a survey of management agencies for reported run timing dates from commercial weir catches prior to 2003. We note, weir catch data can be biased. For example, most silver eel fishing in New England began in September and stopped in November due to cold river temperatures. Additionally, the 2015 USFWS status review GLHA references in the PSP does not assess eel timing at dams above West Enfield (FERC No. 2600) or include the site-specific movement data needed to inform protection measures on the West Branch of the Penobscot River. Moreover, the data included in the status review, related to yellow eels, was data collected prior to the Penobscot Restoration Project which resulted in the removal of two dams on the river and saw the increase of flashboard heights at multiple projects.

As stated in our study request

> *The timing of downstream migration of adult eels is not defined for the West Branch of the Penobscot River and there is not information about the size of the eels attempting to move downstream past the six projects that comprise Ripogenus and Penobscot Mills. Therefore, the general effects of hydroelectric project operations on eel survival to the ocean are unknown. Although separate study requests have been submitted to address project-specific downstream passage route selection, delays, and mortality of eels, general characteristics (size) of eels moving downstream and of river flow and environmental conditions may have significant relationships with project operation and eel migratory success and survival. For example, eels may tend to move immediately before or during periods of significant precipitation (or consequently river flow), times at which projects may be generating at maximum capacity or spilling, which may, or may not, present a higher passage risk to eels. Conversely, periods of low flow may be associated with a significant proportion of total river flow passing through turbine units, which present additional, or different, passage risk to eels. If discrete conditions which promote eel downstream migration are known, it may be possible to take actions with respect to project operations which reduce or minimize passage risk (i.e., operation of a bypass, reduction of intake approach*

*velocities, directed spillage through a particular route at a project, etc). These studies should provide baseline information on river-specific downstream migration to predict when silver-phase eels are expected to migrate downstream in the West Branch, from which project operations could be modified to minimize passage risks.*

The Service notes, for the Commission's awareness, that we will be requesting this evaluation at hydroelectric dam relicensings throughout Maine moving forward (where timing information is based on trapping information or existing data is not suitable to inform downstream passage protection measures). While nighttime movement and migration is commonly reported in peer-reviewed, published, studies, daytime movement also occurs, as demonstrated in the Susquehanna River (Eyler et al. 2016; Travade 2010). If night-time (or periodic) shutdowns or other protective measures for eels are to be seriously considered at hydroelectric projects, site-specific movement data are needed. Without site-specific data, the dates used historically in Maine as defined by GLHA above are highly generalized, and potential mitigation measures implemented during this period, like nighttime shutdowns, may or may not be effective at protecting emigrating eels. Additionally, the Service notes that eel surveys conducted during subsets of days or seasons will only detect individuals present during those intervals and will not detect the actual movement patterns and abundance of eels at projects. Knowing that eels potentially move at all times of the year and throughout the day, more robust studies outside of previously defined windows of time are needed at hydroelectric projects to better define project impacts and identify appropriate, site-specific mitigation measures.

Ultimately, eels are migrating past the Projects that are part of this licensing proceeding, as indicated by the Applicant in the PAD and at the PSP meetings. Therefore, GLHA is obligated to protect eels as they attempt to emigrate downstream past each development. By performing this study as requested, the resource agencies and the Penobscot Indian Nation (PIN) can (1) assess any potential impacts related to project operations; and (2) develop adequate protection measures needed to meet management goals and objectives.

*Downstream American Eel Passage Alternatives Study*

No comment.

*Freshwater Mussel Survey*

The Service respectfully requests that the Commission approves this study as submitted in our October 7, 2021, PAD comment and study request letter. The PAD provided limited information on the distribution and abundance of freshwater mussels within the West Branch of the Penobscot River and within the vicinity of the Ripogenus and Penobscot Mills projects. As stated at the PSP meeting, the last freshwater mussels survey to be performed in limited sections of the West Branch River was in 2009 by MDIFW. Water manipulations and drawdowns from hydropower generation can decrease the amount of habitat available to mussels and can cause mortality to any mussels that might be exposed due to generation. The need for this information, a nexus, and appropriate methodology are explained further in our PAD comment letter.

Ultimately, the Service requests that GLHA conduct a mussel survey (1) in each project impoundment and bypass reach; and (2) in Project-affected reaches downstream from dams and powerhouses (e.g., Upper Gorge, Holbrook Side Channel, what GLHA is referring to as the "Back Channel", Millinocket Stream, etc.) to determine the species composition, distributions, and abundance of freshwater mussels, including the State-listed brook floater (*Alasmidonta varicosa*), yellow lampmussel (*Lampsilis cariosa*), and tidewater mucket (*Leptodea ochracea*).[5]

We note, the study submitted for this proceeding has been submitted at a number of proceedings throughout the Northeast and has either been adopted without issue by the hydropower owner or has been approved by the Commission.[6]

*Terrestrial Wildlife and Botanical Resources Study*

The Service respectfully requests that the Commission approves this study as submitted in our October 7, 2021, PAD comment and study request letter. The Project area contains habitat suitable for the Federally Threatened Northern Long-Eared Bat and may contain habitat suitable for the Federally Threatened Canada lynx and its designated Critical Habitat and, according to the PAD, multiple State-listed species may occur in the vicinity of the Projects (at all six developments). GLHA states it is not proposing any new construction, changes to current land management practices, or new land management activities as part of this licensing proceeding. However, the PAD provides no descriptions of the types of land management practices that GLHA currently employs. At the PSP meeting, GLHA stated they did not manage the land in any way but when asked by Commission staff if there was forest management occurring within the Projects boundaries, GLHA stated there was. Therefore, the Service reiterates its request for this study as originally written.

Without knowing what terrestrial resources currently exist and what wildlife occurs in the project areas (or what types of land management and/or maintenance activities GLHA routinely undertakes) the Service is unable to determine if impacts are currently occurring or if they may occur under any new conditions that could be imposed via a new license (e.g., additional recreational amenities such as trails). These information gaps need to be filled so that stakeholders can assess any potential impacts related to project operations and develop adequate protection measures to meet management goals and objectives. Plants and wildlife occurring in habitats in the project areas may benefit from protection, mitigation, and enhancement measures, given the potential effects of current and future operations and maintenance activities. Additionally, this information will help the Commission in forming a factual basis for a complete analysis of GLHA's application under the National Environmental Protection Act (NEPA).[7]

*Northern Long-eared Bat Acoustic Study*

[5] The brook floater is also a priority at-risk species for the Service.

[6] Fiske Mill (FERC No. 8615), Turners Falls (FERC No. 1889), Vernon (FERC No. 1904), Bellow Falls (FERC No. 1885), Wilder (FERC No. 1892), Cavendish (FERC No. 2489), Taftville (FERC No. 2662), Mine Falls (P-3422), etc.

[7] In SD2, the Commission lists the following as a preliminary environmental issue to be addressed in the NEPA, "Effects of continuing to operate the Projects on state-protected wildlife and plant species (e.g., little brown bat, eastern small-footed bat, wood turtle, etc.), including Species of Special Concern and Significant Wildlife Habitat listed under Maine's Natural Resources Protection Act and potentially in the project area."

No comment.

Studies Adopted with Modification

*Impacts of Water Level Fluctuations on Riparian and Aquatic Vegetation, including Invasive Species, Associated Wildlife, and their Habitats in the Ripogenus and Penobscot Mills Impoundments*

GLHA states, in the PSP, that this study was adopted with modifications and is addressed in the *Water Quality Study*. However, the goals of the *Water Quality Study*, as described in the PSP, is "…to collect contemporary water quality data, determine the composition of the Project's benthic macroinvertebrate community, and collect aquatic habitat data at the Ripogenus Project." Therefore, the proposed study does not address the goals and objectives outlined in our study request which are:

1. collect data on how water surface elevation changes hourly over the course of three years;
2. quantitatively describe and map wetland types within 250 feet of the shoreline, and describe associated wildlife;
3. delineate, quantitatively describe, and map all wetland types, including invasive species and wildlife observed (e.g., bald eagle nesting, waterfowl nesting, etc.) within 200 feet of the shoreline, and the extent of this habitat if it extends beyond 200 feet; and
4. quantitatively describe (e.g., substrate composition, vegetation type and abundance) and map shallow water aquatic habitat types subject to project operation inundation and exposure, noting and describing additional areas where water depths at the lowest operational range(s) are wetted to a depth less than one foot (flats, near shore areas, gravel bars, with very slight bathymetric change).

Consequently, the Service respectfully requests that the Commission approves the *Impacts of Water Level Fluctuations on Riparian and Aquatic Vegetation, including Invasive Species, Associated Wildlife, and their Habitats in the Ripogenus and Penobscot Mills Impoundments* study as submitted in our October 7, 2021, PAD comment and study request letter. The information that would be collected for this study is needed to determine whether existing operations affect plants, habitats, and wildlife in the project areas, whether aquatic vegetation and its habitats can be enhanced by modifications to project operations, or other mitigative measures, and whether there is any unique or important shoreline or aquatic habitats that should be protected. This information will also help the Commission in forming a factual basis for a complete analysis of GLHA's application under NEPA.[8]

*Upstream American Eel Passage Assessment*

[8] In SD2, the Commission lists the following as a preliminary environmental issue to be addressed in the NEPA, "Effects of continuing to operate the Projects on state-protected wildlife and plant species (e.g., little brown bat, eastern small-footed bat, wood turtle, etc.), including Species of Special Concern and Significant Wildlife Habitat listed under Maine's Natural Resources Protection Act and potentially in the project area."

The Service respectfully requests that the Commission approves this study as submitted in our October 7, 2021, PAD comment and study request letter. Performing an upstream eel passage assessment at just one of the six developments being relicensed is insufficient to inform potential protection, mitigation, and enhancement measures related to upstream eel passage at each dam. As stated in GLHA's PAD, and at the PSP meetings, eels are located in each of the impoundments associated with the Projects. Therefore, the Applicant is obligated to provide safe, timely, and effective passage to eels as they attempt to move upstream past each development. Additionally, while we appreciate GLHA's modifications to our study request, the Service does not support the methodology being proposed as it will not identify areas where juvenile eels are congregating at each dam. For example, bright spotlights are known to be ineffective at observing eels at night as these animals tend to shy away from bright lights; red headlamps should be used instead. Additionally, while binoculars have been used in relicensing studies in the past, this methodology is unreliable if the Applicant is unable to get close to the dams. The study, as requested by the Service in our October letter has successfully been performed at a number of hydroelectric projects in our 14-state region. The results of these studies have informed the implementation of upstream eelways and therefore the safe, timely, and effective passage of these animals.

While the Applicant states that they are not adopting our request for trap/pass collection to evaluate permanent eel passage at any of the six developments because "…given the likely low number of American eel at the site; passive methods are typically ineffective at sites with low American eel density", there is no information to support this statement as studies, to date, have not been performed at these projects to inform the density of eels. Moreover, the applicant gives no substantiated reason to reject a sampling timeframe that would accurately detect eel abundance and movement (i.e., April 1 to November 30, once per week). As stated in the *Evaluation of American Eel Size and Timing of Downstream Migratory Movements* section above, if we are only looking for eels during a certain period of time, or during certain times of the day, that will be the only times during which we observe eels. Knowing that eels potentially move at all times of the year, and throughout the day, more robust studies outside of previously defined windows of time are needed at hydroelectric projects in Maine, including the six developments that comprise Ripogenus and Penobscot Mills, to ensure safe, timely, and effective passage is provided during the duration of any newly issued license.

*Downstream American Eel Passage Assessment*

In the PSP GLHA states, "In lieu of conducting a large-scale, comprehensive field assessment, GLHA proposes to examine the question regarding potential effects of downstream passage on adult American eel at each of the Projects' developments through a desktop assessment." However, a desktop assessment will not provide information like route of passage, latent mortality, level of injury experienced by an eel as it attempts to pass the Projects, delay, how eels interact with each development as they move downstream, or the cumulative effects of passing the six developments that are part of this relicensing (Mensinger et al. 2021). This information is necessary to determine the effects of Project operations on the Service's trust species within the West Branch and the subsequent development of any mandatory terms and conditions for this licensing proceeding. This information will also help the Commission in forming a factual basis

for a complete analysis of GLHA's application under the NEPA.[9] Therefore, the Service respectfully requests that the Commission approves this study as submitted in our October 7, 2021, PAD comment and study request letter.

In addition to the above comments, the Service supports the study requests submitted by the National Marine Fisheries Service, the PIN, the Department of Marine Resources, MDIFW, Trout Unlimited, Ed Spear, and the other Non-Governmental Organizations (NGO's) participating in this proceeding.

Thank you for this opportunity to comment. Please direct any questions to Julianne Rosset at julianne_rosset@fws.gov.

Sincerely,

AMANDA CROSS

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Date: 2022.02.22 12:57:21 -05'00'

Amanda S. Cross, Ph.D.
Project Leader
Maine Field Office
Maine-New Hampshire
Fish and Wildlife Service Complex

cc: FERC, Secretary (e-filed)
PIN, Dan McCaw
NMFS, Dan Kircheis, Jeff Murphy
MEDEP, Kathy Howatt
MEDMR, Casey Clark
MEDIFW, John Perry, Kevin Dunham
RO/Fisheries, Bryan Sojkowski
TU, Steve Heinz
ES: JRosset:02-18-21:(207) 298-3080

[9] In SD2, the Commission lists the following as a preliminary environmental issue to be addressed in the NEPA, "Effects of continuing to operate the Projects on upstream and downstream passage of American eels in the West Branch."

## LITERATURE CITED

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Elora Way, Portland, ME.
To whom it may concern:

I am a part-time resident of Millinocket.

I am writing to share my enthusiastic support for flow studies that will help evaluate recreational opportunities and the ecological well-being of the Ripogenus Dryway, the West Branch below Stone Dam, and Millinocket Stream. These waterways are of profound importance to our local communities and the future of our region.

Thank you for your time and consideration.

Ms. Kimberly D. Bose
February 28, 2022
Secretary,
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426. VIA Electronic Filing

**Reference: Ripogenus Hydroelectric Project (P-2572)**

RE: Comments in Support of the February 22, 2022 Maine Department of Environmental Protection Study Request, Ripogenus Hydropower Project (FERC No. 2572) Impoundment Fish Assemblage Study. Accession No. 20220222-5171

On February 22, 2022 the Maine Department of Environmental Protection (MeDEP) filed a much needed Fish Assemblage Study Request. I fully support this request and its goals. However, understandably, MeDEP was reluctant to define precise methods and goals, the request as it stands is open ended. While the study request mentioned "the river" (West Branch) it was silent on the need for fish assemblage collections in the many tailwater reaches below specific project facilities. In the paragraphs below, I highlight data gaps to be filled and suggest other goals for the study.

Ripogenus Impoundment; The Maine Department of Inland Fisheries and Wildlife (MeDIFW) in its October 8, 2021 filing (page 6) referenced poor growth of Ripogenus Impoundment adult landlocked salmon (salmon) resulting from the lack of juvenile (Age 0+) smelt available as prey to the impoundment and downriver West Branch salmon populations. Other than the apparent scarcity of juvenile smelt, there is no quantifiable smelt data available e.g., age structure and abundance, spawning success, availability of food (zooplankton). It is

absolutely clear that MeDEP fish assemblage study includes smelt. Sampling of the impoundment smelt populations (ages 0-III+), at a minimum in the Caribou and Chesuncook basins, should be included in field study plans. These data are desperately needed to describe population dynamics.

MeDIFW has expressed the very reasonable concerns with the use of gill nets in project waters. Ripogenus Impoundment adult salmon are at perilous low levels and conventional gill netting should be avoided. There are a number of commonly used collection methods that target the relatively small sized smelt while avoiding by-catches of salmonid species. Lackey (1970) used fine mesh (1/4-1/2 inch) vertical nets in Echo Lake in coastal Maine. Gorman, O. (1984) used 0.5-m plankton nets ( of 0.355-, 0.450-, 0.560-, and 0.750-mm mesh). Trawls were used to collect Great Lakes smelt by Kirn and Labar (1996) and while studying Lake Champlain, they used night time trawling to collect Age I and older alewives and smelt. Simonin et al. (2012) used hydroacoustics, trawls, and gill nets to document vertical fish, including smelt, distribution. Hrabik and Magnuson (1999) collected rainbow smelt during the summer using “single mesh, 4-m-wide vertical gill nets of 19-, 25-, 32-, 51-, and 64-mm stretch mesh that extended from the surface to the bottom”. Olson et al. used slightly larger vertical nets (25 and 50 mm mesh size) in Lake Ontario to collect smelt and other prey species. The use of the vertical gill nets or some combination of the above referenced methods should provide the necessary insight into the smelt community while protecting the presently improvised Ripogenus Impoundment adult salmon population.

Downriver Tailwater areas: It appears that fish assemblage studies of the riverine reaches below project facilities were included in the MeDEP study request. In order for FERC staff to undertake the balancing act required in FERC licensing, the status of riverine salmonid fish need to be described in some

detail e.g., abundance, growth and seasonal habitat. It is extremely likely that night time boat electrofishing in areas such as Little A Deadwater (aka The Salmon Hole, drift boat take out), and just below e.g. a few hundred yards, North Twin, Millinocket (the Grinder Room) and Dolby Dams can accomplish these goals in a relatively short time frame (one night).

Thank you for the opportunity to comment on this critical study.

Ed Spear

307 Mt Hope Ave.
Bangor, Me 04401
Phone; 207-217-4288
Email; edspear1@yahoo.com

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ORIGINAL

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**Region I – New England**
**5 Post Office Square, Suite 100**
**Boston, MA 02109-3912**

P-2572

March 2, 2022

FILED
SECRETARY OF THE
COMMISSION
2022 MAR 15 A 9:35
FEDERAL ENERGY
REGULATORY COMMISSION

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**RE: Tribal Concerns Regarding Dam Operations and Relicensing in Maine**

Dear Secretary Bose:

At an EPA Region 1 Tribal Leaders Summit held in October 2021, two Tribal Nations in Maine, the Penobscot Indian Nation and the Houlton Band of Maliseet Indians, raised concerns related to relicensing and fish passage operations of certain dams in Maine.

The Tribal Nations shared these concerns with EPA in the context of our statutory authority under the Clean Water Act, which establishes the national goal that water quality should provide for the protection and propagation of fish, shellfish, wildlife, and recreation in and on the waters of the United States. EPA coordinates closely with states and tribes to establish water quality standards for waters that protect these goals, including designated uses and water quality criteria to protect those uses.

The Penobscot Nation voiced concerns regarding the adequacy of fish passage on dams that impact waters where tribal members fish for sustenance in the west branch of the Penobscot River, including the Penobscot Mills Project dams, Ripogenus Dam and Stone Dam. In particular, the Penobscot Nation is troubled with the lack of flow over Stone Dam and the resultant dewatering of the west branch of the Penobscot River below Stone Dam. As a result of the Penobscot River Restoration Project, anadromous fish that have long been absent in the Penobscot River are now returning for the first time in over 100 years. It is for this reason that the Penobscot Nation is keenly interested in current relicensing efforts of a number of these dams to ensure adequate passage of key tribal cultural fish species, so that Penobscot tribal members can practice their cultural lifeways and reserved rights associated with sustenance fishing in waters within the west branch of the Penobscot River.

The Houlton Band of Maliseet Indians (the Band) expressed concern regarding adequacy of fish passage at dams on all rivers that flow into the Gulf of Maine. These dams impact fisheries in their watershed (St. John River) and the Band's related habitat restoration efforts. The Band identified

the Lockwood and Shawmut dams on the Kennebec River and dams in the Mousam River and Union River as particular areas of concern.

Consistent with the federal government's trust responsibility and EPA's authority under the Clean Water Act, in June 2020, EPA approved the State of Maine's submission of water quality standards that protect tribal sustenance fishing as a designated use for certain waters in Maine where tribal members fish for sustenance. To the extent that current dam relicensing efforts and issues associated with fish passage operations at existing dams impact the respective river watersheds that support sustenance fishing, EPA remains interested and supportive of protecting these interests.

While appreciating the need for developing and maintaining renewable energy resources, EPA strongly advocates for unfettered fish passage where possible, and for adequate fish passage where warranted. This is of particular importance for waters upstream of dams where tribal members fish for sustenance and where adequate fish habitat and presence is required to meet Maine's federally-approved water quality standards for waters classified as Class A and AA and accompanied by a standard that "aquatic life shall be as naturally occurs." [1] These include a number of tributaries in the west branch of the Penobscot River upstream of the dams listed above.

In past correspondence, EPA has commented on issues surrounding river restoration and the fate of legacy river flow impediments such as dams. By virtue of this letter, EPA is not commenting on any specific FERC-related dam relicensing efforts. However, EPA believes that restoration of aquatic habitat and unfettered, natural, self-sustaining runs of anadromous fish will greatly benefit the ecological function and health of these rivers and their respective watersheds in Maine, as well as protecting the health and cultural values of the tribal communities and others that depend upon these important natural resources.

As you know, EPA has various roles in the FERC relicensing process, including review of National Environmental Policy Act (NEPA) documents, oversight of the State of Maine's CWA 401 certification program, and requisite consultation under FERC's regulations at 18 C.F.R. § 5.1. EPA looks forward to ensuring the concerns raised in this letter are addressed through these various mechanisms.

Please contact CAPT Michael Stover, EPA Region 1 Indian Program Manager, at (617) 918-1123 or stover.michael@epa.gov should you have any questions.

Sincerely,

David W. Cash
Regional Administrator
EPA Region 1

cc: Elizabeth Molloy, FERC Tribal Liaison
Keith Masill, FERC Office of External Affairs
Amanda Gill, FERC Office of Energy Projects

[1] 38 M.R.S. §§ 465(1)(B), (2)(B) http://www.mainelegislature.org/legis/statutes/38/title38sec464.html

Elbridge G Cleaves, Weston, ME.
COMMENTS TO FERC REGARDING WEST BRANCH PROJECT P-2572

While my wife and I have been avid fly fishers for years we had not fished the West Branch extensively until the past six years or so as seasonal campers at Big Eddy Campground. However, during my professional career as a manager and forester one of the firm's major clients owned the E2 of T3R12 around Ripogenus Lake and the southern part of Chesuncook - thus I am no stranger to issues relating to impoundments, FERC, flowage rights and the operators of dams, including Rip.

Therefore, my comments are based on observations about the apparent changes in the approach to the management of a public resource from the past owners to current, and the recent heavy manipulation of flows as it impacts anglers, fisheries, and the natural world in general.

1) Direct involvement in the angling community seemed to be a priority of prior owners, which meant "we are concerned and responsive to how we manage a public resource." Now current ownership does not seem to share that same approach. Was the approach of the prior owner an anomaly, or is a lack of direction and assignment of priority by FERC to the new?
2) it is understandable that the current management of water would be governed primarily by mitigating the effects of climate change but is that decision-making so focused on the bottom line it comes at the undue expense of anglers and the natural world. There must be a better way to address climate change than the huge fluctuations in flow demonstrated over the past few years especially during the drought of 2021. We fear something must change or what is at stake may soon become moot.
3) Many evenings after 5:00PM (when rafters are off the river) the flow dramatically dropped to the point where boat and/or canoe access to the river was severely impeded, if not rendered impossible. While these developments may be seen only an inconvenience, to us it is a disregard of anglers and a lack of understanding of fishing on the west branch. We believe the fish react accordingly by changing feeding habits and location and thus are in a constant state of stress with resulting negative impacts on health and numbers.
4) There have also been severe drops in water levels/flows (well below required minimums) caused by some combination of a computer glitch and/or lack of an override to the automated system. While I am far from an expert in understanding all the inputs and modelling used to regulate water flows and hydro dams, there must be an override to an automated system given the current vulnerability of infrastructure world-wide and the potential for devastating impacts on natural resources.
5) Lastly, the impact of low water especially if dropped precipitously and regularly heavily impacts the entomological and ecological balance of the river system. For us, the West Branch has demonstrated it is one of the most complex and prolific producer of "bugs" and a "challenge to fish" anywhere in Maine. This rich resource is the reason fishing the West Branch is revered by new and old alike. More people are coming to its banks than ever before and are leaving a portion of their resources to the economic betterment of the Katahdin region.

I recognize my comments above are more anecdotal than scientific but nonetheless are reflective of the sentiment of anglers I know that fish the river. If there is a lack of scientific evidence to support or refute these comments, then that gap needs fixing – not ignored or buried under the rug. Anglers and the fisheries need to have a stronger say in the affairs of the West Branch right along with the other benefactors including the rafters, kayakers and the millions of consumers who live in the down State megalopolis. Thank you,

Elbridge & Judy Cleaves

My history

My name is Edward Spear. Beginning in 1977 and continuing into the early 2000s I worked for (then) Great Northern Paper (GNP) as a fisheries biologist with my primary responsibility being the West Branch of the Penobscot River (WB) drainage (from the Quebec boundary to the Medway Dam). During this period, I collected and analyzed data and co-authored FERC applications for Big A, Ripogenus, Penobscot Mills, and the Storage Projects. During that time, I participated in numerous agencies, stakeholder, and Non Government Organizations workshops and meetings as well as overseeing mitigation and enhancement measures. I believe I qualify as an expert of the West Branch of the Penobscot River drainage. The following comments are a continuation of verbal testimony made on the evening of September 9, 2021 and should be regarded as expert testimony.

Kimberly D. Bose, Secretary
March, 9 2022
Federal Energy Regulatory Commission
888 First Street, N.E. Room 1A
Washington, DC 20426
Filed Electronically

**Ripogenus Hydroelectric Project (FERC No. 2572), Yet Another West Branch of the Penobscot River Flow Violation Below McKay Station**

Recently, March 5th or 6th, 2022, West Branch of the Penobscot Rivers flows below McKay Station (West Branch) were reduced to 860 CFS. This flow violates a license minimum flow requirement of 1000 cfs as well as violating a spawning and incubation flow requirement of 1300 cfs. While the severity of environmental impacts of this dramatic flow reduction are unknown at this time, landlocked salmon (salmon) spawning success is threatened and aquatic communities' abundance further reduced. This most recent minimum flow violation by Great Lakes Hydro America is the most ecologically dramatic of the many 2021-2022 West Branch flow transgressions.

The Licensee's Pre-Application Document (PAD) proudly makes frequent reference to protection, mitigation, and enhancement (PM&E) measures. These measures were implemented by Great Northern Paper as part of the 1996 FERC license and for the most part have not been reevaluated in 20 plus years. The exceptions are lake level and flow management, so called, PM&E measures. The 2021 draining of the Ripogenus Impoundment and the dewatering of the West Branch, with the March 5, 2022 event being the most lethal, were obvious to all project visitors e.g., anglers, boaters, camp owners, campers, sightseers, etc. As the Licensee takes full credit for PM&E measures in the PAD, they must assume full responsibility for their actions when PM&E measures fail resulting in catastrophic biological loses e.g., loss/alteration of impoundment littoral zones,

the failure to provide suitable McKay Station flows resulting in the loss of flow into the Holbrook Bypass channel that was designed to support salmon spawning, incubation, and nursery life stages (Article 406), serious flow reduction and loss of downstream salmon spawning, incubation and nursey areas, and the loss of macro invertebrates communities abundance, function and diversity.

The Ripogenus license states*; Article 402 of the existing license requires minimum flows downstream of McKay Station into the West Branch as specified in Table 4.4-1. These flows may be temporarily modified if required by operating emergencies beyond the control of the Licensee and for short periods upon agreement between the Licensee and the Maine Department of Environmental Protection (MDEP) and Land Use Planning Commission (LUPC). Minimum flows may also be modified (to outflow approximates inflow) if required by hydrologic conditions beyond the control of the Licensee upon mutual agreement between the Licensee, USFWS, MDEP, LUPC, and MDIFW. Consistent with the August 19, 1997 FERC order approving and modifying the Water Management Plan, changes in flows below McKay Station are accomplished through the turbines; however, if necessary, GLHA will open a gate at Ripogenus Dam to augment flows.*

The key component of the above Article is: *hydrologic conditions beyond the control of the* licensee. Beginning in May 2021, the licensee had total control of Ripogenus storage as well as upstream storage in the Licensee's storage Project (P-2634). The Licensee's computer monitoring surely demonstrated falling lake levels with reduced inflow and weather forecasts provided little hope of significant precipitation. In managing storage, the licensee also chose to ignore Great Northern Paper's Water Management Plan. The use of 38 plus Billion Cubic Feet of useable storage including tributary inflow was a business decision designed to maximize energy production and profit. The licensee did so and depleted storage with total disregard of environmental needs. Fish, aquatic communities as

well as recreationalist paid the price and will continue to pay the price (in lost salmon reproduction) in 2022 and beyond.

The 1996 FERC Ripogenus License was based in part on the value of West Branch salmon fishery and “relatively stable base flows”. These conditions no longer exist. The 1996 license also provides some flow modification flexibility, however the licensee is required to consult with the resource agencies e.g., Maine Department of Inland Fisheries and Wildlife, the US fish and Wildlife Service and Maine Department of Environmental Protection. There are no FERC E-library filings that suggest possible consultations occurred. Another in a series of Ripogenus Project license violations that resulted in continuing environmental degradation.

If license conditions are to be meaningful, FERC needs to respond to the licensee’s continued disregard for conditions, guidelines and goals set forth in the 1996 FERC License. FERC must hold the licensee responsible for operational decisions, e.g., peaking, and high base flows, made when it was clear that no storage would be available to meet fall and winter environmental goals. FERC can not allow the Licensee to act as it pleases, the environmental communities will not survive, or survive in the manner described in the 1996 Environmental Impact Statement. Fish, aquatic communities and anglers need to be considered.

Thank you for the opportunity to comment.

Ed Spear
307 Mt Hope Ave.
Bangor, Me 04401
Phone; 207-217-4288
Email: edspear1@yahoo.com
CC: Alicia Burtner via email

March 13, 2022

Kimberly D. Bose,
Secretary Federal Energy Regulatory Commission First Street, N.E.
Washington, D.C. 20426

Subject: Ripogenus Project (FERC No. 2572); Minimum Flow Reductions Comments

Dear Secretary Bose:

I am writing in response to the letter submitted March 9, 2022 by Kevin Bernier of GLHA regarding minimum flow reductions in the Ripogenus Project. I greatly appreciate GLHA evaluating snowpack and recognizing the amount of water released from Ripogenus dam needed to be modified to support future water releases. In their letter, GLHA presents the drought as the sole cause of the current problem.

They claim, " *licensee for the Ripogenus (FERC No. 2572) and Penobscot Mills (FERC No. 2458) Projects, has been implementing water conservation measures on the Upper Penobscot since the current drought intensified beginning in 2020*," and provide the following as evidence of water conservation efforts:

> *1. The Canada Falls, Seboomook, Caucomgomoc, and Ragged Lake Developments have been largely operating at minimum flow, or at a reduced minimum flow developed through agency consultation, since the current drought began in 2020.*
>
> *2. Through agency consultation, the Ripogenus spawning and incubation flows (which are required from October 15th – June 7th) have been set at 1,300 and 1,100 cfs in 2020 and 2021 respectively, much lower than the 1,700 cfs flow that had been set annually the previous 7 years. GLHA has not deviated from the current 1,100 cfs minimum flow since it was set in October.*
>
> *3. Ripogenus flows have been routinely reduced during non-rafting hours (i.e., from 5:00 p.m. to 8:30 a.m.) to conserve water storage in the Ripogenus impoundment.*

I applaud these efforts, although I question the claim of reduced releases during non-rafting hours. Our experience on the lake and rivers has not reflected "routinely reduced flows during non-rafting hours." Throughout July and August of 2020 and 2021 we often saw releases above the minimum required and well beyond hours required. An example of daily releases is represented in the chart below, which is a screen shot from Brookfield's Water Flow site in August of 2021:

AS OF SAT AUGUST 14 11:41AM EDT

Total Flow 3100 cfs

## SHORT-TERM SCHEDULE

| START DATE | START TIME | END DATE | END TIME | CFS |
|---|---|---|---|---|
| 8/11/2021 | 8:00 AM | 8/11/2021 | 9:00 PM | 3,000 |
| | 9:00 PM | 8/12/2021 | 8:00 AM | 1,800 |
| 8/12/2021 | 8:00 AM | 8/12/2021 | 5:00 PM | 2,200 |
| | 5:00 PM | 8/12/2021 | 9:00 PM | 3,400 |
| | 9:00 PM | 8/13/2021 | 8:00 AM | 1,800 |
| 8/13/2021 | 8:00 AM | 8/13/2021 | 12:00 PM | 2,000 |
| | 12:00 PM | 8/13/2021 | 5:00 PM | 3,000 |
| | 5:00 PM | 8/13/2021 | 9:00 PM | 3,400 |
| | 9:00 PM | 8/14/2021 | 8:00 AM | 1,800 |
| 8/14/2021 | 8:00 AM | 8/14/2021 | 5:00 PM | 2,200 |
| | 5:00 PM | 8/15/2021 | 8:00 AM | 1,800 |
| 8/15/2021 | 8:00 AM | 8/15/2021 | 5:00 PM | 2,200 |

As the Short-Term Schedule indicates, water was generously released during non-rafting hours far exceeding minimum requirements. Rafting releases were also beyond minimum license requirements as explained by GLHA, "*Project license requires that minimum whitewater recreation flows of between 2,000 and 2,300 cfs be released from the Project between 0830 and 1700 hrs. on a daily basis.* ***In a "dry" hydrologic year (such as 2021), the required minimum flows are 2,200 cfs on Saturdays and Sundays, 2,000 cfs on Mondays and Fridays, and 1,800 cfs on Tuesdays through Thursdays.*** *During other hours of the day* ***outside of the whitewater release time period (i.e., 1700 to 0830 hrs), requires a minimum flow of 1,000 cfs*** *from June 8th through October 14th.*

Analysis of the Scheduled Flow Chart clearly demonstrates releases exceeding minimum requirements by as much as 2400 cfs. Releases between 1700 to 0830 hours exceed minimum flows by at least 800 cfs. If flows *"set at 1,300 and 1,100 cfs in 2020 and 2021 respectively,"* are *"much lower than the 1,700 cfs flow that had been set annually the previous 7 years"* are recognized as an important water conservation effort, certainly flows of 800 -2400 cfs beyond minimum requirements are recognized as significantly excessive.

There is no question lake levels are low and dramatically impacted by the drought. It is important GLHA and all of the stakeholders recognize the low water levels are also the result of project operations. GLHA states, *"Recent surveys in the upper Penobscot drainage have shown average*

*water content in the snow to be about 20% below the long-term average. In addition, water levels are currently much lower than normal in both the Ripogenus (almost 22 feet below full pond) and North Twin (almost 8 feet below full pond) impoundments.*" Twenty percent below average snowpack does not result in Ripogenus Impoundment being 22 feet below full lake – excessive water releases in a time of drought does.

In their letter, GLHA explains the reduced flows, "*are the same minimum flows implemented as the result of the most recent (2001 – 2003) extended severe drought in Maine."* We purchased our camp in 2003, and spent a large amount of time in the fall of 2002 on the lake deciding to make the purchase. At that time, despite a severe drought, the lake levels were not nearly as low as they are now, as evidenced by the fact that we were able to park our boat on the first mooring, something that has quickly become impossible in recent early summers. Family pictures show the lake in the fall of 2002 and spring of 2003 much higher than lake levels in recent years.

The purpose of this letter is to provide both anecdotal and empirical evidence that the low lake levels are not only the result of the drought, but that the problem has been exacerbated by operational practices. My hope is that this will provide the Commission with a clearer understanding of what is truly happening on the waterways. I also hope GLHA will acknowledge how operations have contributed to the problem so mistakes can be corrected, and future operations can be modified and improved.

Ten years of historical operations data has been requested by nearly all NGOs and government agencies involved in this process. The data exists. Within this data lies the facts necessary to make informed, accurate decisions, as recent events illustrate.

Relicensing these dams is a colossal undertaking that can only be done with an honest, accurate understanding of the realities of the situation, and with all parties involved engaged in good faith, cooperative efforts. FERC has the immense responsibility to balance the needs of all stakeholders involved. This can only be done with a complete and accurate picture of what dam operations have been over the current owners tenure, and the impacts of those operations on the rivers and lakes, fish and wildlife, and recreational users.

Thank you for your time and consideration.

Sincerely,
Kathleen K Houston
PO Box 145
Kingfield, ME 04947
khlally14@gmail.com

Document Accession #: 20220321-5037 Filed Date: 03/21/2022

March 19, 2022

Ms. Kimberly D. Bose
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

TROUT UNLIMITED
MAINE COUNCIL

**Via online submission to: http://www/ferc.gov**

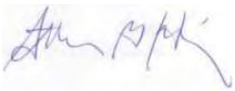
Subject: **Comments of Maine Council of Trout Unlimited for the Ripogenus Project (P-2572)**

Dear Secretary Bose:

This responds to emails from Donna Burnett of FERC DocOps & Records Management transmitted March 17, 2022. We had posted a FERC issuance directly to two subdockets to ensure that FERC Compliance and FERC Relicensing staff were mutually aware of the issuance. We were informed that this is not allowed but that "You can submit the FERC Issuances as an attachment or as supporting documentation."

The FERC issuance is germane to both subdockets. Please file this document in its entirety to the subdockets. Its relevance is self-explanatory.

Respectfully,



Stephen G. Heinz

Maine TU Council FERC Coordinator

Attachment A – FERC Issuance of March 1, 2022; Subject: Allegation of Minimum Flow Deviations

# Attachment A

**FEDERAL ENERGY REGULATORY COMMISSION**
**Washington D.C. 20426**

**Office of Energy Projects**

Project No. 2572-134—Maine
Ripogenus Hydroelectric Project
Great Lakes Hydro America, LLC

March 1, 2022

VIA FERC Service

Kelly Maloney
Great Lakes Hydro America, LLC
150 Main Street
Lewiston, ME 04240-1398

Subject: Allegation of Minimum Flow Deviations

Dear Ms. Maloney:

This letter is in reference to September 21, 2021, January 5, 2022, and February 22, 2022 filings with the Federal Energy Regulatory Commission (Commission) alleging deviations from the minimum flow requirements at the Ripogenus Hydroelectric Project No. 2572. Minimum flow requirements are established by Article 402 of the project license.[1] Flow requirements vary based on date, time, and hydrologic year type, in order to facilitate the operations of the Penobscot Mills Hydroelectric Project No. 2458, salmon spawning, and whitewater recreation. Article 402 also stipulates that during generating unit failures at McKay Station, the minimum flow becomes 400 cubic feet per second (cfs), until the other flows required by Article 402 can be restored. Article 402 states that this should occur as quickly as possible, but outage-induced low flow events must be resolved within 3 days of the initial outage.

Trout Unlimited's September 21, 2021 allegation, which was supplemented on January 5, 2022, described potential deviations beginning around 1200 hours on August 30, 2021 and 0800 hours on September 16, 2021 and provided documentation of fish and macroinvertebrate strandings as a result of rapid declines in flows. We requested that

[1] Order Issuing License (77 FERC ¶ 61,066), issued October 22, 1996.

you respond to the allegation by letter dated September 21, 2021, and you filed your response with the Commission on October 14, 2021. The February 22, 2022 letter, from Mr. Ed Spear, broadly alleges that you have not adhered to the salmon spawning flows required by Article 402. The January 5 and February 22, 2022 letters also provide recommendations for the relicensing of the Ripogenus Project, which will be considered by the Commission's Division of Hydropower Licensing as part of the project's licensing proceeding; subdocket P-2572-133.

Regarding the allegations of noncompliance with your current license, you indicated that the August 30, 2021 and September 16, 2021 low flow events occurred as a result of unit outages. As such, you were required to provide 400 cfs, as measured using an hourly average, for a maximum of 3 days while resolving the outage.

**August 30, 2021 Low Flow Event**

On August 30, 2021, you were required to provide a minimum flow of 2,000 cfs for whitewater recreation during a dry hydrologic year. At 1205 hours, a unit tripped due to thunderstorms in the area, activating the 400 cfs minimum flow requirement. You report that you experienced an instantaneous low flow of 109 cfs immediately following the unit outage, but you were able to restore flows above 400 cfs within 13 minutes, resulting in an hourly average flow that remained in compliance with Article 402. You were able to restore the whitewater boating flows of 2,000 cfs by 1530 hours the same day. You note that you did not notify the Commission of the event, as it was not a deviation from the Article 402 requirements; however, you provided a courtesy notification to the U.S. Fish and Wildlife Service, Maine Department of Environmental Protection, and Maine Department of Inland Fish and Wildlife. No agencies provided comments.

**September 16, 2021 Low Flow Event**

On September 16, 2021, you were required to provide flows of 1,000 cfs for the protection of spawning salmon. A non-project transmission line disturbance caused a unit trip at McKay Station at 0731 hours, causing an instantaneous drop in flow to as low as 118 cfs. You were able to restore flows to 400 cfs within 5 minutes, maintaining a compliant hourly average, and to 1,000 cfs by 0958 hours. As with the August 30, 2021, low flow event, you did not report it to the Commission, as it was not a deviation from license Article 402; however, you did provide a courtesy notification to the resource agencies but received no comments in return.

**February 22, 2022 Filing**

On February 22, 2022, Mr. Ed Spear filed an additional allegation, broadly stating that you have not complied with the salmon spawning protection flows required by Article 402 and in doing so, not complied with the salmon habitat improvements required by Article 406.[2] The filing alleges that the fall low flow events were preventable, as ample water was available, and that any flows below 1,000 cfs should be considered a violation of your license. As discussed above, Article 402 of the license allows for flows as low as 400 cfs in the event of a unit outage, but salmon protection and whitewater boating flows should be restored as soon as possible.

Based on our review of the available information, it appears that the alleged deviations were permissible low flow events which occurred after unit outages. You acted quickly to maintain 400 cfs baseflows and to restore whitewater rafting and salmon spawning protection flows. We understand that sharp declines in flow are difficult to avoid following unit trips, that the redistribution of flows after a unit trip requires time to safely open gates or start other units, and that you have been able to restore flows reasonably quickly during such events. However, Trout Unlimited's and Mr. Ed Spear's concerns with the resulting environmental effects are valid. Therefore, after filing the requested operational data with the Commission in the relicensing proceeding,[3] we encourage you to work with Trout Unlimited, the resource agencies, and Commission staff to develop a proposal to address strandings and include it in the final license application you file by September 30, 2024. In the meantime, we also encourage you to conduct aquatic habitat surveys immediately following any future unit outages, if time allows prior to restoration of flows. Surveys should determine if any adverse environmental effects are occurring, and if so, you should consult with the resource agencies to determine any appropriate actions needed during those low flows.

[2] Order Approving Recommendations of Habitat Improvement Plan Under Article 406 (102 FERC ¶ 62,116), issued February 20, 2003.

[3] See Commission staff's October 8, 2021 letter.

Thank you for your cooperation. If you have any questions regarding this letter, please contact Alicia Burtner at (202) 502-8038 or alicia.burtner@ferc.gov.

Sincerely,

Andrea Claros
Chief, Aquatic Resources Branch
Division of Hydropower Administration
and Compliance

Greg Labonte, Gorham, ME.
For over a decade I have watched the native salmon of the west branch decline due to poor water regulations. The economic stimulus of excellent fishing is an absolute must for an already economically deprived area. Excellent fishing is dependent on regular flows. Last fall, September 30th, the water was so low, I could have walked across the river at any point. Class 5 rapids had become class 1. This time of year is critical for salmon spawning success. There may have even been salmon stranded in side pools the water was so low. Trout Unlimited is trying to conduct a study to determine how many salmon get stranded at a critically low water level. If this study reveals even a handful of salmon, there must be safe guards put in place to stop this from happening. The west branch is a unique resource, very few places on earth have such a resource. If we squander it with poor dam management, we will be repeating history, not learning from it.

Brookfield Renewable

March 23, 2022

***Via Electronic Filing***

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Revised Study Plan**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), a subsidiary of Brookfield Renewable and Licensee of the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458) (collectively referred to as the "Projects"), herein files with the Federal Energy Regulatory Commission (FERC or Commission) the Revised Study Plan (RSP) for the relicensing of the Projects. The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot Counties, Maine.

On June 11, 2021, GLHA filed the Notices of Intent and Pre-Application Document (PAD), which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through the Commission's Integrated Licensing Process (ILP). Subsequently, FERC issued Scoping Document 1 (SD1) on August 10, 2021 and held daytime and evening virtual scoping meetings on September 9, 2021.[1] Additionally, on the afternoon of September 9, 2021, GLHA hosted a virtual environmental site review.

Between June 11, 2021 and October 13, 2021, a total of approximately 50 stakeholders filed written correspondence with FERC providing general comments, comments regarding the PAD, comments regarding SD1, and/or study requests. On November 22, 2021, FERC issued Scoping Document 2 (SD2). Also on November 22, 2021, GLHA filed a single Proposed Study Plan (PSP) for the Projects. GLHA hosted a two-day virtual PSP meeting on December 15 and 16, 2021 to provide stakeholders the opportunity to review, comment, and ask questions related to the PSP. Between October 14, 2021 and March 7, 2022, a total of approximately 31 stakeholders filed written correspondence with FERC providing general comments, comments regarding SD2, and/or study requests. In total, approximately 38 study requests were filed with FERC.

GLHA has carefully evaluated and considered all comments and study requests filed in response to the PAD, SD1, SD2, and PSP, and has incorporated, or otherwise addressed, these comments and study

[1] As specified in SD1, the Commission did not conduct in-person public scoping meetings or in-person environmental site reviews due to concerns with COVID-19.

Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462
www.brookfieldrenewable.com
Tel: 207.723.4341
Fax: 207.723.3948

requests in this RSP. As listed below, GLHA is proposing to conduct 16 studies, which wholly or partially address more than 20 study requests.

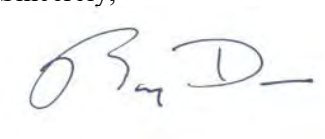
1. Water Quality Study consisting of the following components:
    a. Impoundment Trophic State Study (Ripogenus & Penobscot Mills Projects)
    b. Impoundment Aquatic Habitat Assessment (Ripogenus & Penobscot Mills Projects)
    c. Downstream Temperature and Dissolved Oxygen Study (Ripogenus & Penobscot Mills Projects)
    d. Riverine Aquatic Habitat Assessment (Ripogenus & Penobscot Mills Projects)
    e. Benthic Macroinvertebrate Assessment (Ripogenus & Penobscot Mills Projects)
2. Instream Flow and Habitat Assessment of West Branch downstream of Stone Dam Study (Penobscot Mills Project)
3. North Twin Impoundment Tributary Access Survey (Penobscot Mills Project)
4. Upstream American Eel Passage Assessment Study – Presence, Distribution, and Relative Abundance of Juvenile Eel (Penobscot Mills Project)
5. Desktop Downstream Eel Passage Route and Survival Study (Ripogenus & Penobscot Mills Projects)
6. Recreation Study (Ripogenus and Penobscot Mills Projects)
7. Whitewater Boating Assessment Study (Ripogenus and Penobscot Mills Projects)
8. Aesthetic Study (Ripogenus and Penobscot Mills Projects)
9. Historic Architectural Survey (Ripogenus & Penobscot Mills Projects)
10. Historical Operations Data and Assessment Study (Ripogenus & Penobscot Mills Projects)
11. Operations Model Study (Ripogenus & Penobscot Mills Projects)
12. Wood Turtle Habitat and Presence Evaluation Study (Ripogenus & Penobscot Mills Projects)
13. Marsh Bird Survey Study (Ripogenus Project)
14. Furbearer Survey Study (Ripogenus Project)
15. Common Loon Management Plan Assessment Study (Ripogenus Project)
16. Riparian and Littoral Habitat Assessment Study (Ripogenus & Penobscot Mills Projects)

Additionally, as requested by FERC and various stakeholders, GLHA is providing daily operations data from 2010-2021 for each development associated with the Projects. The information can be found in Appendix S of the RSP.

Concurrent with this filing, GLHA is providing a copy of this letter to all parties listed in the attached distribution list. Parties with interest in the upcoming relicensing can download an electronic copy of the RSP from FERC's eLibrary system at https://www.ferc.gov/docs-filing/elibrary.asp by conducting a search using the docket numbers p-2458 and/or p-2572.

If you have any questions regarding the RSP, please contact me by phone at (207) 775-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman
Licensing Manager
Brookfield Renewable

Enclosure: RSP for the Ripogenus and Penobscot Mills Hydroelectric Projects

cc: Distribution List

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

## Federal Agencies

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Stephanie Carman
Acting District Manager
Northeastern States
Bureau of Land Management
626 E. Wisconsin Avenue, Suite 200
Milwaukee, WI 53202-4617

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Kimberly Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Deborah Szaro
New England Region 1
Regional Administrator (Acting)
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Kenneth Hogan
North Atlantic-Appalachian Region Hydropower
Program Coordinator
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03301

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

## State Agencies

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation,
and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation,
and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation,
and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Kathy Howatt
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
101 Second Street
Hallowell, ME 04347

## Municipalities and Government Officials

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Dr. Annette Padilla, PhD
Interim Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
4 Gabriel Drive, Suite 3
Augusta, ME 04330

Jeffery Gifford
State Representative
346 Frost Street
Lincoln Center, ME 04457

Peggy Jo Stanley
State Representative
413 Turnpike Road
Medway, ME 04460

## Native American Tribes

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Marla Dana
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

John Banks
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

## Additional Parties

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Stephen Perry
Representative
Carpenters Health and Safety Fund

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Kelly Maloney
Manager
Great Lakes Hydro America LLC
150 Main Street
Lewiston, ME 04240

John Dicentes
President
International Association of Machinists
64 Congress Street
Millinocket, ME 04462-1312

Robert Farrington
International Brotherhood of Fireman
HCR 86, Box 195
Medway, ME 04460

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney &
Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Director
Maine Professional River Outfitters
PO Box 669
Millinocket, ME 04462-0669

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Bill Houston
Board of Directors
National Wildlife Federation

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Allison Economy
Representative for Allagash Gateway
Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Thomas Nannery
Sportsman's Alliance of Maine
RR 1 Box 1174
Augusta, ME 04330-9801

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Jeffrey Reardon
Maine Brook Trout Project Director
Trout Unlimited
267 Scribner Hill Road
Manchester, ME 04351

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Jeff Fayle
jfayle@gmail.com

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti
granby@cox.net

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris
nsharris@mgh.harvard.edu

Kathy Houston
58 Mystery Road
Kingfield, ME 04947

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Charles Paone
cpaonejr@gmail.com

Richard Parkes
Rparkesbb3@yahoo.com

Ed Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Robert Van Deventer
bobvnert@gmail.com

Wes Zemrak
2 Brookside Drive
Falmouth, ME 04105

March 31, 2022

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**RE: Comments on the Revised Study Plan for the Ripogenus (FERC No. 2572) and Penobscot Mills (FERC No. 2458) Hydroelectric Projects**

Dear Secretary Bose:

On March 23, 2022, Great Lakes Hydro America, LLC (GLHA) filed its revised study plan for the Ripogenus (FERC No. 2572) and Penobscot Mills (FERC No. 2458) hydroelectric projects on the Penobscot River in Maine. Despite our comments filed on February 7, 2022, the revised study plan indicates that GLHA does not intend to adopt our recommended studies at the project. We continue to disagree with GLHA's decision and stand by our request for the following studies at the projects: 1) Indicators of Hydrologic Alteration Model; 2) Project Effects on River Temperature in the West Branch; and 3) Future Flow and Water Temperature Study.

On October 8, 2021, the Commission issued an Additional Information Request for detailed operations data needed to clarify how the projects are operated on a daily basis. Specifically, the Commission requested GLHA include 10 years of operations data (in excel format) for each project, and that this information be filed with GLHA's proposed study plan on, or before November 23, 2021. None of the requested data were provided by GLHA by the Commission's November 23 deadline. In response, NMFS filed a comment letter on GLHA's proposed study plan, dated February 17, 2022, where we once again asked that GLHA provide this data as well as hourly outflow data for McKay Station, North Twin, Dolby, Millinocket, and East Millinocket Projects for the last 10 years; these data are critical to inform the development of proposed studies for the Ripogenus and Penobscot Mills projects. It wasn't until March 23, 2022 concurrent with issuance of GLHA's revised study plan (four months after the Commission's deadline) that some of the data that were requested were provided, leaving only 15 days for the agencies and stakeholders to review and comment on ten years of data. Given that GLHA failed to provide this data in accordance with the timeframe set forth by the Commission, or on a timeframe that would allow for this data to be considered in any proposed study plan, we are requesting that the Commission grant the agencies and stakeholders an additional 60 days on the deadline to file comments on the revised study plan. This time is necessary to allow the agencies and stakeholders sufficient time to review this information and incorporate it into our responses to GLHA's revised study plan.

In addition, we are reiterating our request for hourly flow data downstream of each generation facility in the Penobscot Mills and Ripogenus projects. While we specifically requested this data in our February 17, 2022, comment letter on the Proposed Study Plan for the projects, GLHA did not provide the data with the Revised Study Plan. This data is readily available to GLHA as evidenced by the March 10, 2022 letter to FERC where GLHA submitted hourly flow data at McKay Station for September 7, 2021. We are asking that this data be provided by April 15, 2022. The April 15 deadline and 60 day extension on the review will allow the agencies and stakeholders sufficient time for the review of ten years of operations data in order to provide comprehensive comments on the RSP. All parties to this relicensing must have a precise understanding of the mode of operating the Ripogenus and Penobscot Mills projects to identify potential effects to environmental resources in the project areas. We will use the additional 60 days to analyze project outflows and impoundment elevations to provide FERC with well-informed comments on the RSP which will ultimately benefit the environmental assessment for this relicensing.

If you have any questions or need additional information, please contact Dan Kircheis (Dan.Kircheis@noaa.gov) or 207-866-7320.

Sincerely,

Julia E. Crocker

Julie Crocker
Chief, ESA Fish, Ecosystems, and Energy Branch
Protected Resources Division

cc: Service List

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Great Lakes Hydro America, LLC
Application for New License

Ripogenus Hydroelectric Project
FERC No. 2572

Penobscot Mills Hydroelectric Project
FERC No. 2458

# AMERICAN WHITEWATER AND APPALACHIAN MOUNTAIN CLUB COMMENTS ON REVISED STUDY PLAN REGARDING THE RIPOGENUS HYDROELECTRIC PROJECT (P-2572) AND PENOBSCOT MILLS HYDROELECTRIC PROJECT (P-2458)

American Whitewater ("AW") and Appalachian Mountain Club ("AMC") submit the following Comments in response to the filing of the Revised Study Plan ("RSP") for the Ripogenus Hydroelectric Project and Penobscot Mills Hydroelectric Project (FERC Project Nos. P-2572, P-2458) by Great Lakes Hydro America, LLC ("GLHA" or "licensee"), to inform FERC's development of the Study Plan Determination.

AW and AMC have long been involved with the FERC licensed hydropower projects in Maine, including hydropower projects located on the Penobscot, Kennebec, Rapid, and Magalloway rivers, and are party to settlement agreements that provide for whitewater boating opportunities that partially mitigate for project impacts at many of these projects. Our organizations participated in the initial scoping meeting and filed comments; submitted PAD and scoping comments, as well as study requests for these Ripogenus and Penobscot Mills projects; and commented on the licensee's Proposed Study Plan. We file these comments to address remaining deficiencies in GLHA's Revised Study Plan ("RSP") in relation to study requests by our organizations and other stakeholder in the FERC relicensing to adequately understand the aesthetic, ecological and recreational impacts of project operations in, below and in proximity to the project boundary. We request that FERC consider these comments along with those filed by resource agencies, and other stakeholder groups in developing a Study Plan Determination that will provide the necessary information to will inform the environmental analysis of project effects on non-developmental resources.

American Whitewater is a national non-profit 501(c)(3) river conservation and recreation organization founded in 1954. With approximately 6,000 members and 100 affiliate clubs, representing tens of thousands of whitewater paddlers across the nation, American Whitewater's mission is to protect and restore our nation's whitewater resources and to enhance opportunities to enjoy them safely. Our members are primarily conservation-oriented kayakers and canoeists, many of whom live and/or engage in recreational boating in the New England region within easy proximity of the Penobscot River. American Whitewater has long been involved with the FERC licensed hydropower projects in the Maine, including hydropower projects located on the Penobscot, Kennebec, Rapid, and Magalloway rivers, and are party to settlement agreements that provide for whitewater boating opportunities that partially mitigate for project impacts.

Since 1876, the Appalachian Mountain Club has promoted the protection, enjoyment, and understanding of the mountains, forests, waters, and trails of the Appalachian region. AMC is the largest conservation and recreation organization in the Northeast with more than 90,000 members, supporters, and advocates, many of whom visit the lands and waters upstream and downstream of the projects for recreation.

## Comments

Comments on Appendix F – Recreation Study Plan

The RSP only slightly expands the scope and methodology of the licensee's proposed Recreation Study Plan to include an assessment of boat access to the project impoundments, a recreation user survey, and to include winter use in the assessment. AW and AMC appreciate the inclusion of these items in the study scope but reiterate our request that the scope of the study also include all formal and informal recreation sites as well as those recreation sites located near and adjacent to the projects, which would also expand the scope of the assessment as outlined in 4.1.5 of Scoping Document 2 ("SD2").

Though AMC and AW appreciate the inclusion of a recreation user intercept surveys in the study methodology, we request that the study methodology also include an online survey, input from a stakeholder working group, and key person interviews with organizational representatives from user groups, representatives of camp owners and other recreation related interests, such as outfitters. It is not practical for our organizations or, for example, a camp owner on one of the lakes, rivers, or upland areas to be expected to travel to a FERC approved recreation site to complete the survey, nor does the survey instrument speak to the feedback of these audiences as a broader representation of the needs, opportunities and issues that would be brought forward by these audiences. Expanding the study methodology to include these engagement methods will ensure that the interests of recreational users are well captured and not based solely on the opinions of the intercept survey respondents, which may or may not reflect the broader feedback and needs of that user group. Expanding the study geography to also include informal access sites and recreation areas near and adjacent to the projects will ensure a better understanding of recreational uses, preferences and related issues and should be included in the study methodology. We acknowledge that some of this information may be better captured though an online survey, stakeholder working group, and key person interviews, than collected by intercept as informal recreation areas are hard to identify and staff for a traditional intercept survey.

Comments on Appendix G – Whitewater Boating Assessment Study Plan

The licensee has proposed a Whitewater Boating Assessment Study in the RSP, which AW and AMC requested, and which FERC acknowledged in SD2 as resources to be evaluated in the NEPA document. AW and AMC welcome the licensee's addition of this study in the RSP but wish to ensure that the study is conducted in accordance with the industry standard methodology and is inclusive enough in scope to adequately assess whitewater boating opportunities impacted by the projects using data, information and methodologies that are current.

Specifically, the licensee, in Section 10.0, Deviations from Requested Study, proposed a "Whitaker-type study" and further explains that "the requested flow study is unnecessary…". AW and AMC disagree with this deviation and the notion that the outcome and findings of assessment conducted can be pre-judged as the licensee has done here. Whitaker 2005 provides an industry standard methodology that is incremental, such that Level 1 is used to determine if a Level 2 or 3 analysis is needed. FERC should correct this misunderstanding in issuing a Study Plan Determination that follows Whiteaker 2005 and requires that a Level 2 and/or 3 study will be included in the study methodology if deemed necessary during Level 1 on each of the four river reaches identified in our study request and reflected in the study scope.

In Section 2.0, the licensee describes the goals of the study, which misrepresent the needs of the study to inform the FERC NEPA process as described in SD2. The goals of the study should be to evaluate flows for paddlers on four reaches of the river (Upper Gorge, below McKay Station, below Stone Dam, and Millinocket Stream), and not to solely "use existing information and paddler knowledge", as proposed by the licensee. It is inappropriate to list the goals of the study to discount the potential need to conduct a Whitaker Level 2 or 3 study if deemed appropriate. The objectives of the study are also inadequate as they follow the language of the goals and do not indicate that a Level 1 Whittaker study may indicate that a Level 2 or 3 study is needed.

In section 5.0, the licensee describes Background and Existing Information. Regarding the Upper Gorge Below Ripogenus Dam, we believe that the licensee inaccurately describes this reach as "unsafe" and with difficult access, neither or which are correct characterizations. The licensee is unqualified to make determinations of boating safety. The licensee cites numerous examples online of publicly available videos of kayaks, canoes and rafts using this reach, demonstrating both that this reach is safe to navigate at certain levels by experienced boaters, and that access is currently possible. This language should not be included in the FERC Study Plan Determination.

Specific to the West Branch Below Stone Dam, SD2 and the comments of AW, AMC and Maine Department of Conservation, Division of Parks and Public Lands on the PSP requested that the West Branch below Stone Dam be assessed to adequately evaluate the needs and opportunities related to this resource for whitewater boating and other recreation. In the RSP, related to Stone Dam in section 5.0, AW and AMC believe the licensee is seeking to justify their lack of interest in following the Whitaker 2005 methodology by arguing that flows needed for such an analysis cannot be provided. AW and AMC find this assertion to be unclear and inconsistent with other publicly available information related to the operating parameters of the Stone Dam.

Though the licensee claims that the inflatable flashboards that have replaced the old gate structures at Stone Dam prevent the licensee from conducting a controlled flow study in this reach, AW and AMC find this contradictory to filings on this project to the Low Impact Hydropower Institute in their application and the reviewer's report in that docket (https://lowimpacthydro.org/lihi-certificate-167-millinocket-dolby-hydroelectric-project-maine/). Regarding the Stone Dam inflatable structure, the LIHI docket notes that Stone Dam may be used to attain the 2,000 cfs minimum flow downstream of the Millinocket Project when the Millinocket project is offline. The LIHI docket notes that, "During periods of high seasonal flows or whenever abnormal conditions occur such that turbine flow [at the Millinocket Project] cannot be passed to achieve the 2,000 CFS minimum flow, the pneumatic rubber flashboard

system [at Stone Dam] is deflated to release flows in an expeditious effort. When this occurs, a two-minute siren warning is initiated and a safe flow of 200 CFS is released for fifteen minutes. Increases of 400 CFS per hour are made until either the required downstream flow is met, the elevation at Stone Dam falls to 459.45 FTMSL or the pneumatic rubber flashboard system is fully deflated. The ramping down of flows in the Back Channel is initiated once turbine hydraulic capacity is restored or seasonal flows start returning to normal." Provided that this information is accurate, it appears that Stone Dam can be operated in such a manner to assess whitewater paddling with an on-water component as part of the study if deemed necessary after Whitaker Level 1 study through single flow or multiple flow on-water study. This should be corrected in the Study Plan Determination.

Though we appreciate that the licensee will "redouble" its efforts to locate available information on this reach below Stone Dam, absent data being available that was collected consistent with the Level 1 Whitaker methodology, AW and AMC reiterate our request to follow the Whitaker methodology to assess whitewater in this reach through all three study levels as appropriate. It is inappropriate for the licensee to argue that "sufficient information exists" as articulated in section 10.0 when that information has not been located and may not be located during this licensing proceeding for this reach.

In section 7.0, the licensee proposes components of the methodology for the Whitewater Boating Assessment Study. In section 7.3, the licensee proposes Paddler Interviews and Surveys. AW and AMC believe that this is an important component of a Whitaker 2005 Level 1 study, though we wish to collaborate with the licensee to help identify boaters and other paddling related organizations that can assist in identifying potential respondents. No information is provided on the number of respondents sought, and we propose that a small sample size may not provide adequate information. In 7.4, Report Preparation, AW and AMC agree with the licensee that the report should "include recommendations regarding the need for further evaluation of whitewater boating conditions in the four study reaches," though we are troubled that the licensee is not proposing any next steps, if deemed necessary, as articulated in 2.0, Goals and Objectives. This inconsistency should be corrected by adjusting the language of the study Goals and Objectives to ensure that, if appropriate, the licensee will proceed to a Whitaker Level 2 or 3 analysis for one more of the four study reaches.

The licensee includes a Whitewater Boating Assessment Study – Interview Survey Form in the RSP. AW and AMC appreciate reviewing and commenting on the draft survey instrument. We also request that all surveys conducted be included in their entirety in the Initial Study Report, as scanned or photographed copies, and that the licensee not simply digitize or aggregate this valuable data. First, it is unclear how surveys will be completed "In person" as shown on the survey instrument. We welcome the licensee visiting local rafting outfitters, river access points and engaging directly with paddlers in-person, and we suggest that the recreation survey intercepts planned also have the whitewater survey on hand for whitewater padders to complete if found at a recreation site. We suggest expanding the survey to include an online opportunity for respondents and a kiosk style take and drop methodology, which will be able to reach a much larger audience. Specifically on question number 9, AW and AMC prefer that the survey instrument not just project a yes or no response to whether a reach is boatable and a suggested classification range, but also an opportunity for a narrative description of the experience, either

categorized as too high, high, medium, low, too low and/or a 1-5 scale of the quality and enjoyment of the experience at the identified flow as was included in question 5. The goal of the study is not just to assess what flows can be navigated, but to understand user flow preferences and enjoyment. Gathering the data from question number 5 and 9 are the best opportunities to fully capture user satisfaction and preferences. Though question 15 provides an opportunity for a respondent to note how they become aware of river flows, we know that at least three of the four reaches in the study area do not have any available information online or provided by the licensee and rely solely on visual confirmation made on site by paddlers. An addition question should be added that asks, "How would you prefer to find out about river flows occurring in this reach in the future?" to provide recommendations for how best to share this information with the public.

In summary, AW and AMC look forward to working with the licensee on the Whitewater Boating Assessment Study. We request that FERC issue a Study Plan Determination with a methodology following Whitaker 2005, not a "Whitaker-like" study, which has is not the industry standard. AW and AMC also believe that the licensee identifies much existing literature and data that will help inform this study and should help ensure that the Whitaker Level 1 component can and will be completed, informing the need or lack thereof to continue to a Whitaker Level 2 or 3 study.

Comments on Appendix H – Aesthetics Study Plan

AW/AMC requested that the licensee conduct an aesthetics study. We appreciate and acknowledge that the licensee is proposing to conduct an aesthetics resources study focused on the use of Key Observation Points at FERC-approved Project recreation sites and from other KOPs frequently used by the public, which are identified in Table 1 and 2, though we are concerned that the proposed study will rely exclusively on "photo and video documentation" and will not solicit or incorporate feedback from the public related to the documentation collected and may also lack an analysis of the documentation which would be needed to inform the NEPA analysis and future license conditions.

We recommend that the licensee form an aesthetics study working group to further identify KOP's in the project boundary and in areas affected by project operations. This working group can also work with the Licensee to further refine survey instruments and data collection methods such as intercept and online surveys, as well as to engage with the licensee in reviewing the study data to assist in analyzing this data to be included in the Initial Study Report. We recommend that the working group include our organizations, resource agencies, and other interested stakeholders. The licensee should also further specify that the aesthetic evaluation will be conducted by the working group and other stakeholders on-site rather than solely relying on a review of photographic documentation of its facilities and operations.

Comments on the Socioeconomic Study as Proposed but Not Adopted in the RSP

The licensee did not adopt the Penobscot Indian Nation's proposed socioeconomic study, to which AW and AMC respond by requesting that FERC require this study in the Study Plan Determination. AW and AMC commented in our PSP filing that significant changes in the

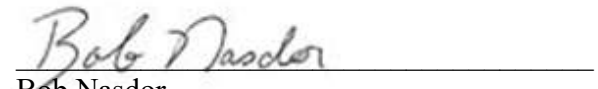
region have occurred due to the closure of the Great Northern mill, previously tied to the projects, which requires that FERC evaluate the current socioeconomic conditions to ensure that non-developmental values are balanced appropriately and support the outdoor recreation economy, that the licensee acknowledges is significant and the primary driver in the region. The licensee, furthermore, agrees that significant changes have occurred in the region since the last licensing proceeding, as articulated in the RSP. Specifically, regarding nexus, the licensee notes that the projects were previously connected directly to the paper mills that are now defunct and the licensee acknowledges that the projects provide whitewater releases below McKay Station that support a noteworthy commercial outfitting business, which alone should demonstrate that the projects have nexus to socioeconomic issues in the region and that these impacts should be evaluated in this licensing proceeding, as they have changed significantly since the last licensing proceeding and would inform FERC's NEPA analysis and possible license conditions.

AW and AMC request that FERC require a socioeconomic study as a component of the Study Plan Determination. The licensee's responses to the study request in the RSP fail to demonstrate that the requested study lacks nexus, as the licensee acknowledges the significant socioeconomic changes in the region since the last licensing proceeding, and the licensee provides a boilerplate response to nexus issues that is neither relevant, credible, or specific to the study request of the Penobscot Indian Nation. Furthermore, the licensee argues that the Penobscot Indian Nation's study request lacked a recommended methodology for this study. AW and AMC recommend that the licensee follow the methodology conducted in the Klamath relicensing socioeconomic study, FERC Project P-2082, in which the licensee provides a study that characterizes the current socioeconomic condition and future trends, including population, housing, economic development, local and tribal government budgets, public service, recreational resources, and transportation and utility infrastructure. A stakeholder working group should be established to advise the licensee on the full scope of the socioeconomic study and to provide additional guidance on the study goals, methodology, techniques, and analysis. AW and AMC disagree that these components would be addressed in other studies to be performed. Finally, AW and AMC believe that the findings of this study will inform FERC's NEPA analysis and will inform the development of licensing conditions that will better balance developmental and non-developmental values appropriate to the current and future trends of the region socioeconomically.

## Conclusion

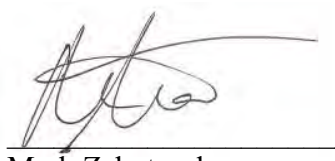
Thank you for considering these comments.

Respectfully submitted this 1st day of April, 2022



Bob Nasdor
Northeast Stewardship and Legal Director
American Whitewater

65 Blueberry Hill Lane
Sudbury, MA 01776
(617)-584-4566
bob@americanwhitewater.org



Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
100 Illick's Mill Rd.
Bethlehem, PA 18017
(610)-868-6915
mzakutansky@outdoors.org

Benjamin Koehler, Orono, ME.
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Specifically, the licensee, in Section 10.0, Deviations from Requested Study, proposed a "Whitaker-type study" and further explains that "the requested flow study is unnecessary…".
I disagree with this deviation and the notion that the outcome and findings of assessment conducted can be pre-judged as the licensee has done here. Whitaker 2005 provides an industry standard methodology that is incremental, such that Level 1 is used to determine if a Level 2 or 3 analysis is needed. FERC should correct this misunderstanding in issuing a Study Plan Determination that follows Whiteaker 2005 and requires that a Level 2 and/or 3 study will be included in the study methodology if deemed necessary during Level 1 on each of the four river reaches identified in our study request and reflected in the study scope.
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Regarding the Stone Dam inflatable structure, the LIHI docket notes that Stone Dam may be used to attain the 2,000 cfs minimum flow downstream of the Millinocket Project when the Millinocket project is offline. The LIHI docket notes that, "During periods of high seasonal flows or whenever abnormal conditions occur such that turbine flow [at the Millinocket Project] cannot be passed to achieve the 2,000 CFS minimum flow, the pneumatic rubber flashboard

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licensing proceeding for this reach.

Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E. Washington, DC 20426

RE: Comments on the Revised Study Plans for Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458) from the Caribou and Chesuncook Lake Camp Owners Association and the Chesuncook Dam Camp Owners Association.

Dear Secretary Bose:

These comments on the Revised Study Plan (PSP) for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) filed for Great Lakes Hydro America, LLC by Brookfield Renewable ("Brookfield") are submitted on behalf of the members of the Caribou and Chesuncook Lake Camp Owners Association and the Chesuncook Dam Camp Owners Association.

The two Associations represent over fifty camp owners with a significant and substantial interest in the relicensing of these projects. We have a long history, and deep love for and knowledge of, Caribou, Chesuncook, and Ripogenus Lakes, as well as a large financial commitment to our properties.

<u>Recreation Study - Inventory/Spot Count/Callibration Count/User Survey Forms Comments</u>

GLHA states, "To the extent possible, GLHA will also utilize recreation use and user survey data collected during the study to evaluate the potential relationship between impoundment water levels and recreation site use." To accomplish this lake levels of the day need to be recorded on all instruments. If not, the connection between water levels and recreational site use cannot be made.

We also support AMC and AWW in their request that the "scope of the study also include all formal and informal recreation sites as well as those recreation sites located near and adjacent to the projects, which would also expand the scope of the assessment as outlined in 4.1.5 of Scoping Document 2 ("SD2")." This scope is necessary to get a true understanding of the project's impact.

We also support AMC and AWW in their suggestion to strategically gather "input from a stakeholder working group, and key person interviews with organizational representatives from user groups, representatives of camp owners and other recreation related interests, such as

outfitters" as these audiences would "ensure that the interests of recreational users are well captured and not based solely on the opinions of the intercept survey respondents, which may or may not reflect the broader feedback and needs of that user group."

We appreciate GLHA including a Recreation Study. Following are items we request be included to ensure all necessary data is collected.

1. Inventory
    a. The inventory at remote sites needs to include distance from the site facilities to the water. For example, "Distance from fire pit to shoreline." Water level at the time of inventory will also need to be noted.
    b. The Boat Launch Facilities inventory needs to include the condition of the launch surface as the word "gravel" is too vague. Include a rating scale of the quality and usability of the surface.
2. Spot Count
    a. Data needs to be collated by lake. Millinocket and North Twin lakes have stable water levels throughout the summer recreational season and will have very different feedback and results than data from Ripogenus, Caribou and Chesuncook Lakes whose current water levels vary dramatically.
3. Calibration Count
    a. Data also needs to be collated by lake for the reasons stated above.
4. User Survey Forms
    a. Include an online survey, and direct mail surveys to camp owners on Ripogenus, Caribou and Chesuncook Lakes. These are the people who use the lake the most, know it well and upon which project operations have the greatest impact.
    b. Users of remote sites must be included in the surveys as this is a significant use of the waterways.
    c. Signage and introduction to the surveys needs to include language telling the respondent that the survey is part of the licensing process for a 30-50 year license. The survey respondent needs to understand the entire purpose of the survey.
    d. The survey needs to include questions about the impact of water levels. For example, include lake level with question 11.

<u>Boat Launch Useability Comments</u>

GLHA proposes to use SOBA'S "industry standard values" for useability of trailered boat launches, "including recommended minimum launching depth of three feet of water at the ramp toe, a maximum depth of one foot below the elevation of the top of the ramp, and a ramp slope not to exceed 15 percent; these guidelines acknowledge that less depth may be suitable for some boats (SOBA 2006)." Chesuncook Lake is the third largest lake in Maine, known for the strong winds that stretch over its 20 plus mile length. As such, the boat launch will need to be able to

accommodate the larger boats necessary for safe navigation on Chesuncook, Caribou and Ripogenus lakes. These boats are at least 17 feet long and often as long as 25 feet. SOBA guidelines also speak to boat launch substrate. The Chesuncook Lake boat launch is currently described by GLHA as "gravel." In their "Gravel Roads, Maintenance and Design Manual," the EPA describes, "Gravel is a mixture of three sizes or types of material: stone, sand and fines," including for road construction, "The base course requires 100% of the material to pass a 1 inch sieve, but allows up to 20% of the stone to be retained on the 3/4 inch sieve." The current Chesuncook Dam boat launch substrate includes rocks at least 4-6 inches wide, with some over a foot or more. This assessment needs to include size of rocks at the boat launch and a determination if gravel is even an appropriate material given wave and ice impacts on the site.

Aesthetics Study Comments

In the Aesthetics Study proposal GLHA acknowledges the visual significance of the project waters. They refer to an Aesthetics study done in 1990. Although the mountain views and wilderness beauty of the area remain solid, the shoreline and water views are very different than in 1990 when water levels were more consistently stable than under current operation. GLHA identifies Objectives of the study as: 1.Document views of Project lands and waters, and the surrounding landscape, from the Project recreation sites and 2. Document views of Project lands and waters, and the surrounding landscape, from other KOPs where the Project is frequently viewed by the public. They further identify "Visual resources related to water include the flatwater expanses of the Project impoundments as well as portions of the West Branch of the Penobscot River and Millinocket Stream." Indeed, these are important objectives and visual resources, yet, more is needed.

An objective that moves beyond documentation and evaluates the connection between lake levels and aesthetics needs to be included. To meet this objective, specific sites of visual importance within Ripogenus, Caribou and Chesuncook Lakes, need to be identified, with photos and video recordings at these sites at different water levels. These are the locations impacted by drastically changing lake levels. Using the same sites identified in a 1990 study does not address the impact of water levels on aesthetic qualities of a location.

Current sites identified for the study are not adequate to meet the suggested objectives. For example, the Abol Bridge site is an iconic view of the largest mountain in Maine, and the end of the Appalachian Trail. This location has been photographed thousands of times. Other than seasonal changes, the visual is always the same. Abol Bridge views are not impacted by water levels. The sites being studied need to show visual variation at different water levels.

The Aesthetics survey also needs to include a question about shoreline and water levels. The distant mountain views are always stunning. It is the shoreline that becomes visually unappealing at low water levels.

These nuances of the area cannot be defined by those who don't spend considerable amounts of time at the project sites. For this reason we support AWW and AMC in their suggestion to form "an aesthetics study working group to further identify KOP's in the project boundary and in areas affected by project operations. This working group can also work with the Licensee to further refine survey instruments and data collection methods such as intercept and online surveys, as well as to engage with the licensee in reviewing the study data to assist in analyzing this data to be included in the Initial Study Report."

Socio Economic Study Comments

GLHA referred to the Socio Economic Study proposed by the Penobscot Indian Nation as lacking a nexus. The nexus is the direct correlation between the project's waters and surrounding land and the socio-economics of the region. In the past relicensing, the region was dependent upon Great Northern Paper Co., which no longer exists, and which the dam generated power directly for and thus supported 2500 regional jobs. Any dam relicensing's true nexus is a chance to evaluate the necessary balance between the use of a public resource, the water that the people of Maine own, with the needs of a private entity and the public good. Clearly the economics of the region has changed dramatically and thus the existing balance has changed. A study is needed to determine if the economic drivers of the outdoor recreation industry and the water needs to support that industry now outweigh the economic benefit of unrestricted power generation and thus a need to recalibrate the new permit to meet those needs. The outdoor recreation industry within the project boundaries clearly includes whitewater boating and fishing on the river. It also includes boating and fishing on the lakes as well and the time and investment people spend at their waterfront properties.

Additional Study Request Comments

There are other studies requested by other stakeholders important to an overall assessment of the needs, protection and potential of project lakes, rivers and communities. A Whitewater Boating Assessment Study is proposed by AMC and AWW using industry standard methodology with an inclusive scope. Industry standard and a broad scope are necessary for all studies within the licensing process. GLHA refers to industry standards in their study proposals, the same should be offered to other agencies. The National Marine Fisheries Services proposes the following studies: 1) Indicators of Hydrologic Alteration Model; 2) Project Effects on River Temperature in the West Branch; and 3) Future Flow and Water Temperature Study. NMFS, a branch of NOAA, mission includes "Productive and sustainable fisheries and healthy ecosystems" This agency understands science and industry standards and should be given the tools, in this case, the requested studies, necessary to complete their mission. The same is true for requests from TU

and the Maine DEP for a fish assemblage study. Our anecdotal evidence also suggests strong merit in Ed Spear's request to study zooplankton and the effects of severe lake draw down on the smelt population. GLHA notes that Maine IFW recognizes an overpopulation of salmon but IFW at the same time closed Chesuncook and tributaries to the taking of smelt. This strongly suggests concern for the smelt population. These experts, and all agency representatives, are experts in their fields working for the benefit of the project's ecosystems, fish and wildlife, as well as all the people who use and enjoy the area. FERC needs to give their input the strongest consideration and require GLHA to perform the requested studies.

Thank you for considering our comments.
Respectfully,

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and
Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947
bhoustonps@gmail.com

Kimberly D. Bose
April 7, 2022
November 9, 2021
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426 Via Electronic Filing

The Ripogenus and North Twin Projects P-2572-133 and 2458-247

RE; Revised Study Plan Comments Filed March 23, 2022 and a Critique of the June 8, 2021 Preliminary Application Document and Notice Of Intent

The Licensee's continues to refuse and refute the need for critical fish, angler, aquatic communities and lake level management studies. As the licensee knows from its sponsorship of multiple studies of the Magpie and Batchawawa Rivers (see Marte, Smokowoski and many others), peaking operations have significant impact on fish and aquatic communities. These and other studies provide much needed peer-reviewed information necessary in evaluating fisheries and aquatic communities relevant to the licensing of two major projects. In addition, robust field studies are needed to define the current status of fisheries and aquatic communities. The March 13, 2022 Revised Study Plan (RSR) submission is a continuation of unsupported claims and the licensee's apparent desire to avoid any study that would demonstrate the diasterous impact of current flow and lake level management. In refuting study requests, rather than citing much needed empirical aquatic and fisheries data or peer reviewed literature, the licensee cites legal precedent(s). This is simply their opinion. The Licensee's objectives are now clear, delay the licensing process as long as possible. Today's license is much better than any new license. Base the licensing process on arguments of legal precedent rather than biological fact. Clearly, this not what the NEPA foresaw.

Preliminary Application Document (PAD)

When I first Read the Preliminary Application Document (PAD) I was shocked by the omissions and misstatements contained in the fisheries and aquatic communities sections. Had a high school student submitted the PAD as a tenth grade history paper, it would have failed. The authors apparent unfamiliarity with data from impoundment, river reaches and tributaries is telling. The PAD is a poorly organized attempt to rehash 40 year old data and develop conclusions that can not be supported by science. The following paragraphs briefly review the PAD flaws that need to be corrected to make the record accurate.

The most pointed of the Licenses' comments is that operations have not changed and everything is as it was in the 1980s and 1990s. They support that contention with 35 plus year old fisheries and aquatic data and then demonstrate that operations have changed in their March 23, 2022 submission of ten years of flow and elevation data. Current operations in no

way duplicate flows and lake levels observed during Great Northern Paper's Rule Curve operations and relatively stable base flows.

2.1 This section appears to be the licensee's opening statement implying that they want a fact based license. "*Search for Existing, Relevant, and Reasonably Available Information In support of preparing this PAD, HDR, on behalf of and in conjunction……..".* This has not happened.

One of the more telling indications of effort to find facts is found in sections 5.4.2 and 5.4.1. "*There are no flow gages immediately upstream, within, or downstream of the Ripogenus and Penobscot Mills Projects,".* USGS has had a flow gage on the North Branch of the Penobscot River for 20 years. Tributary inflow is readily available by "Googling" USGS then Maine, the North Branch of the Penobscot River.

Further evidence of providing miss-information is found in 5.3.4.*1 "The Ripogenus Project is used for hydroelectric power generation, recreation, flood control, and wildlife and aquatic habitat. As described in Section 4.4.1, the Ripogenus impoundment is used to store excess runoff from spring snowmelt and rainfall (e.g., flood control) for the release of water downstream at a controlled rate. <u>This creates stable year-round flows downstream</u> to provide a sustained load of energy and provides fish habitat, recreation*….." <u>*(emphasis added).*</u> MeDIFW questioned this statement it is October 8, 2021 filing, "**MDIFW observed on several occasions in the winter and summer of 2021 that the Licensee was indeed running in excess of 3,000 cfs when lower flows were required by the license;"** The Licensee's March 23, 2022 filing of daily flow records demonstrates the ridiculousness of the "stable year-round flow" comment. There is nothing "stable" in a peaking operation.

Page 5-93 "*Seven tributaries to the Ripogenus impoundment support landlocked salmon spawning runs, including the upper West Branch*". This statement is unfounded and misleading. While juvenile salmon were occasional found in many Ripogenus Project tributaries, there is no evidence of significant spawning or juvenile production in any tributaries other than Ripogenus and Ragged Streams, the upper West Branch and Caucomgomic Stream (where Caucomgomic Lake fish seem to dominate). Cuxabexis Stream has a very limited area (perhaps 500 square yards) of high quality spawning and nursey area.

Page 5-93 "*Small spawning tributaries also exist in the West Branch from McKay Station downstream to the North Twin impoundment, but most salmon spawning occurs in the West Branch itself*." Only Kadahtin Stream provides any spawning <u>and nursery</u> area and due to the relatively short stream length containing salmon habitat, reproduction is limited.

Page 5-93 "*There are no tributaries or riverine spawning habitat between North Twin Dam and Quakish Lake*." This statement is incorrect and this error provides the licensee an opportunity to avoid statutory requirements. During redd survey years (circa 1988-1989), <u>15-20 salmon redds were observed below the "Green Bridge"</u> (Rt 11) downstream to the confluence of Quakish Lake. While young-of-the-year (YOY) salmon were collected in riffle areas, nursey

habitat for this life stage is limited (Vol II E 3.2-42). The PAD' omission of salmon spawning and nursey areas in the West Branch downstream of the North Twin Dam is a serious error. The issue of salmon spawning and reproduction "brings into play" the Maine Department of Environmental Protection' s (MeDEP) statutory requirements e.g., "designated uses" and "naturally occurring" and the need for supplementary production from a watered West Branch Channel (AKA the Back Channel).

The PAD notes that the North Twin tailwater fishery is generally support by hatchery fish, outmigrants from the Upstream Impoundment. MeDIFW noted that salmon stocking was discontinued 2017, present management of the North Twin Impoundment is through natural salmon reproduction. The 1992 GNP license application states that 80 % (EIS 3.5.1.1) tailwater salmon were of hatchery origin. This raises the questions as to how North Twin tailwater recruitment (of adult salmon) needs are presently being met. The limited tailwater juvenile salmon population has been further reduced by the facilities peaking mode. The impacts of present operations on juvenile salmon production downstream of the North Twin Dam can be mitigated though the watering of West Branch Channel. The proposed fish assemblage study should define the status of this tailwater fishery

Page 5-95 "*Lake trout are distributed throughout the Ripogenus, North Twin and Millinocket Lake impoundments*". There no lake trout in the Ripogenus Impoundment and none have been observed in the last 20 years.

Page 5-97 "*Rainbow smelt populations are substantial in the Ripogenus, North Twin, Millinocket Lake, and Dolby impoundments".* While this statement was correct 30-40 years ago, current Maine Department of Inland Fisheries and Wildlife (MeDIFW) studies demonstrate that smelt populations are in serious decline in the Ripogenus Impoundment and West Branch below McKay Station.

Page 5-106 - "*Nineteen tributaries feed into the Ripogenus impoundment that provide habitat for brook trout, landlocked salmon, rainbow smelt, and other native fishes (Figure 5.1-2). Seven of these tributaries (Ripogenus Stream, Duck Brook, Cuxabexis Stream, Caucomgomoc Stream, Little Scott Brook, Upper West Branch, and Ragged Stream) have historically produced enough juvenile landlocked salmon to support a wild, self-sustaining fishery*". In yet another example of the lack of reviewing basic data or a map, Duck brook is not a tributary of the Ripogenus impoundment although it does flow into Ripogenus Stream. The suggestion that rainbow smelt inhabit tributary stream is miss-leading however smelt did spawn (during study) years in many, but not all impoundment tributaries. All smelt spawning occurred within (flow) transition zones within the project boundaries

Page 106 *The Upper West Branch of the Penobscot River is the most important and productive of the Ripogenus impoundment tributaries with regards to spawning and adult habitat (GNNC 1991a). The salmonid fisheries in the Upper West Branch reach are primarily supported by fish from the Ripogenus impoundment population, as opposed to upstream water bodies. The reach*

*provides spawning opportunities for salmon, but also supports its own robust fishery (emphasis added). The river fishery in this reach tends to reflect the status of both populations (river fishery and impoundment fishery) with regards to health and abundance (GNNC 1991a, FERC 1996).* There is NO "river salmon fishery" (emphasis added) i.e., year-long salmon population, the Upper West Branch fishery is entirely supported by Ripogenus Impoundment salmon. The use of salmonid is misleading and incorrect as there are no brook trout or other salmonid species.

Page 5- 109 *This life history is unusual in that landlocked salmon generally spawn in tributaries but rear and grow in larger lakes. The West Branch, however, provides lacustrine adult habitat in the large deadwater areas and pools, and ample spawning and parr nursery habitat in flowing reaches. Necessary forage opportunities are provided to this reach via smelt drift from Ripogenus impoundment*. This statement reflects conditions in the 80s and 90s, current MeDIFW information suggests that smelt drift is poor, at best. The licensee should prove this statement or remove all references to smelt drift.

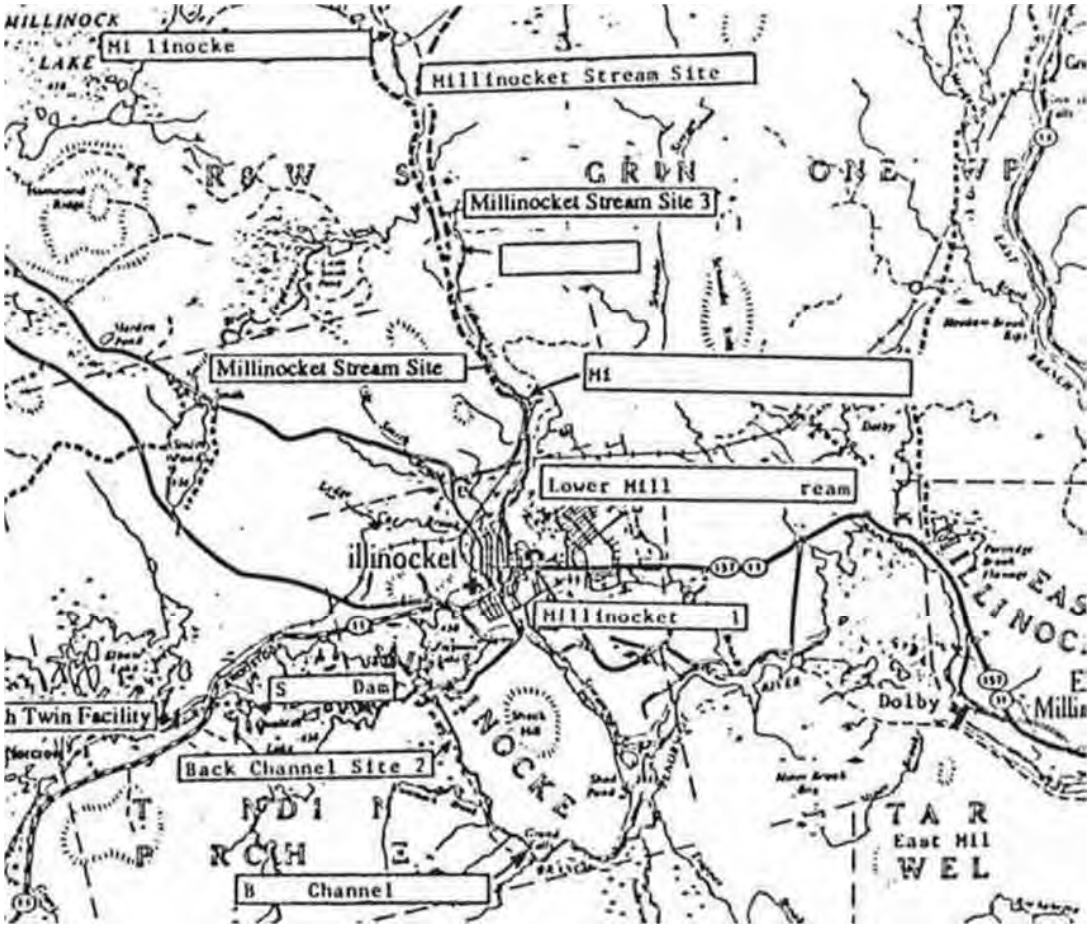
Page 5-110 "*During the previous relicensing effort, the Licensee proposed to provide stable minimum flows from McKay Station into the West Branch to promote landlocked salmon spawning and egg incubation. As such, pursuant to License Article 402, GLHA provides landlocked salmon spawning flows of at least 1,422 cfs (or inflow, but not less than 1,300 cfs) from October 15 to November 15 and incubation flows greater than 1,422 cfs (or the spawning flow established for that year) from November 16 through June 7. These flows were developed to prevent exposure and desiccation of salmon redds and enhance overall reproductive success (FERC 1996). Further, GLHA implements automatic, short-term "outage" flows of 400 cfs downstream of McKay Station during station outages as a temporary means for protecting aquatic habitat in downstream reaches of the West Branch. Stable flows resulting from water management at McKay Station help to maintain constant, high quality flow conditions downstream. Specifically, the water management regime provides high quality habitat, abundant smelt drift, and above average water quality".* While these statements were correct in 1996 this is not the situation now "as *maintain constant, high quality flow conditions downstream"* has been replaced by peaking operations and daily dewatering of critical fish and aquatic communities habitat.

Page 5-110 "*As part of the flow improvements made in the West Branch during the previous relicensing, GLHA developed and constructed landlocked salmon nursery and spawning habitat at the Holbrook Side Channel, which is about 0.8 miles downstream of McKay Station. The project created approximately 14.5 acres of stream habitat for landlocked salmon and other fishes in the Holbrook Side Channe*l." The 1,300 foot Holbrook Side Channel does not provide 14.5 acres of stream habitat. However, when flow is provided, this area supports high quality salmon nursery habitat.

**5.3.4** "*During the previous relicensing of the Projects, the Licensee identified and prioritized water uses and performed operations modeling to create a plan to meet generation requirements, environmental enhancements, and mitigation measures. Based on the modeling*

*results, the Licensee developed a Water Use Plan (WUP) that identified proposed operations of the Projects and that was designed to balance and manage multiple competing water uses (e.g., power generation, recreation, fisheries, minimum flows, flood control). This WUP was used as the basis for the operational requirements for the Projects as indicated in the 1996 FERC licenses, as amended, and as described previously in Section 4"*. The Licensee no longer follows the WUP, thus this statement in misleading. There is zero indication that the licensee considered any non power objectives during 2021-2022 and in other years.

5-131 "*STUDY SITES An IFIM study was conducted using a transect-based Physical Habitat Simulation (PHABSIM) hydraulic model at 2 sites: one site located above Grand Falls and another located below the falls*." This statement is incorrect and misleading. As the map indicates, one study site was a few hundred yards below Stone Dam and the other ABOVE Grand Falls. This error is significant as it goes to the study team's selection of habitat types e.g., parr and adult, parr and fry is relevant to future study goals and site selections.




5 -212 "*Additionally, there are multiple commercial recreational opportunities outside of the rafting industry. The Big Eddy Campground (formerly known as Pray's Cottages) provides fee-*

*based camping and lodging options along the West Branch downstream of McKay Station"*. This is incorrect, Pray's Cottages were located about a half mile downstream of Ripogenus Dam and 400-500 yards West of the Upper Gorge. The Big Eddy Campground, located 1 ½ mile downstream of Rip Dam was owned and operated by Bunny and Peter Pray and sometimes referred to as "Pray's Big Eddy Campground" and is now operated by the Chewonki Foundation.

Page 6-4 "*Baseline Fisheries -West Branch (below McKay Station) Potential effect of Project operations on West Branch fisheries – current baseline • Significant amounts of information/data on West Branch fisheries already exist, as fisheries data were collected during the last relicensing and has continued to be collected by the GLHA and MDIFW. • The existing fisheries data are sufficient to characterize the existing West Branch fishery. • As there have been no changes to Project operations, there are no expected changes or impacts to West Branch fisheries*." This opinion is often repeated. There is no science to back it up as fisheries data has not *"continued to be collected by the GLHA and MDIFW".* As noted multiple times, these statements are out-dated as project operations have undergone dramatic change, from relatively stable bass flow operations to peaking operations.

Millinocket Stream. In my December 6, 2021 filing I noted the Licensee's failure to reference the circa 1994 Millinocket Stream eel weir. While the operator, Mr. Rodney Corvieau, may be able to supply more accurate totals, my recollection is that the catch was several thousand pounds. Significant in any event. At the time of my filing, I assumed this omission was just another example of poor research, mea cupla. In reading the Recent Revised Study Plans it has become clear that the licensee has little interest in science and that all filings are based on developing a "legal setting". Any acknowledgement of a significant eel outmigration from Millinocket Lake would provide a base for downstream eel passage requirements requested by multiple agencies at three downstream facilities. At the very least, FERC should require that the licensee acknowledge significant eel outmigration down Millinocket Stream. References to the eel weir would be recorded on Millinocket Stream Great Northern Paper's creel census forms.

In summary, after reviewing the PAD and RSP it has become obvious that the licensee's intention is to avoid, at all costs, fisheries and aquatic communities studies that would likely demonstrate the continuing impact of peaking operation and the resulting (lack of) lake level management. In filings of January 27, February 12, and February 22, 2022, I provided comments on the improvised fish and aquatic communities of the Ripogenus and Penobscot Mills Projects. Each filing was accompanied with a preponderance of supporting data from peer reviewed journals. It should be noted the licensee did not challenge the science but continued with legal arguments.

**Comments on the licensee's Revised Study Plan.**

Scoping Document Two; Study Plans Resource Issues; 4.1.2, Water and Aquatic Resources

Scoping Document two (SC-2) was developed following comments provided in response to Scoping Document one (SC-1). In SC-2 FERC stated the issues, raised by the stakeholder, would

be addressed. Section 4.1.2 issues most relevant to fisheries and aquatic communities are listed below.

- 1) "Effects of change in historical project operations (based on generation records) on baseline flow patterns in the West Branch, and how such changes may effect aquatic resources in the vicinity of the projects and the West Branch including the effect on fish migration timing and passage in the mainstem of the Penobscot River."
- 2) "Effects of continuing to operate the projects under the existing Water Use Plan and alternatives to that plan …."
- 3) Effects of Project operations on temperature and DO……
- 4) "Effects of drawdowns and fluctuating lake levels on Ripogenus, North Twin and Millinocket Lake Impoundments on littoral habitats and associated aquatic communities…"
- 5) "Effects of Ripogenus Project operations on Lake Whitefish populations in the Ripogenus Impoundment."
- 6) "Effects of Project operation on aquatic insects, crayfish, and other macro invertrabrates in the project impoundments and the West Branch ….."

The Revised Study Plan fails to address many of the stakeholders study concerns mentioned in SC-2 and when it does, only in vague terms with generally unspecified methods. In addition, the Licensee fails to address most of MeDIFW's, the *lead state fisheries agency in Maine,* study requests. The answers to issues raised during SC-1, Sc-2 and by MeDIFW should be though data collections and analysis rather a literature review.

The licensee continues to rebuke virtually all fisheries related study requests not mandated by the agencies**.** For the fish communities, despite the Licensee's March 23, 2022 filing of flow records covering 10 years of flow and elevation data that demonstrate hydro peaking, the licensee continues to insist that "nothing has changed". The licensee argues that 35-40 year old data remains valid. The licensee has basically rejected all studies not included in the PAD. So why is the licensee repeating West Branch channel (AKA the backchannel) and upper Gorge flow studies or the North Twin Impoundment salmon spawning "obstruction" study? In all three cases, the rocks, ledges, and gravels have not changed. The results are known. The answer is obvious, these three studies are "safe", other than North Twin Impoundment salmon collected for radio tagging, no fish collections. There will be no danger that the collection of salmon or trout will provide "new" data that demonstrates reduced growth, abundance or distribution in the lacustrine or riverine project waters.

The Licensee's stock responses to study requests are, "fails to meet study criteria", "MeDIFW didn't request it", and as "being redundant or outside the scoop of the NEPA process". However, the final choice of studies is not up to the licensee rather FERC and FERC staff. As mentioned before, the licensee is assuming a negotiation posture and forming legal positions heading to the end game.

**5.5 Ramping Study to Determine Appropriate Rate of Flow Change below McKay Station**

*"Mr. Ed Spear requested a ramping study to determine the appropriate rate of flow change in the West Branch below McKay Station. Specifically, Mr. Spear requests that a study should include an independent, peer-reviewed water management plan that includes an up and down ramping prescription protective of sensitive aquatic insects, namely hydropsychid caddis and salmonids*."

*"GLHA is not adopting this study as requested. However, GLHA believes that information collected and reported from other proposed studies, such as the Historical Operations Data Assessment Study, will provide information on how the Ripogenus Project has been operated, including flows provided by McKay Station. …* followed by addition verbiage and tabular flow information too often repeated *…..Additionally, field work to be performed in the West Branch below McKay Station for other studies, such as the Wood Turtle Survey, will provide additional information regarding flows in the West Branch in relation to aquatic resources".*

<u>My Response</u>

Both of the above referenced flow and water managements requests are both reasonable and common. Many western water users have "modern" water management plans as well as ramping guidelines. In fact, MeDIFW in its Ocotber 8, 2021 comments stated "*the literature is replete with examples of the detrimental impacts on the riverine fisheries and aquatic communities from rapid changes in flow, and that the literature indicates that flow changes of less than 25% per hour (ramping rate) can mitigate impacts from peaking power, we request flow records to evaluate the frequency of flow changes that exceed 25%".* MeDIFW also requested; "fine tune the water management for the Ripogenus Project Water" in its October 8, 2021 filing. Brookfield's upstream Storage Project license contains 401 WQC ramping prescription at Caucomgomic Dam and Brookfield facility on the Magpie River (Ont, CA) is operated under ramping guidance. Ramping rate studies are often required and ramping rates are a normal license conditions of FERC licenses. The measurement of river elevation changes over flow and time are not expensive and for the West Branch below McKay Station would only require two or three study sites. It is difficult to understand the licensee's objection to this MeDIFW simple study request.

The long awaited and recently provided ten years of flow and elevation records are of no use when considering (rapid) flow change over time. Historical information shown in hourly increments is useless. In the case of ramping, past practices are irrelevant, in the case of flow change, the licensee was following licensed flow prescriptions. The question is the <u>*future*</u> rate of flow change over time, *hydropsychid caddis and salmonids* need future protection.

The licensee failed to mention what other studies would provide flow change data. While I have seen wood turtles on the bottom of the Miramichi River (NB, CA) while snorkeling, it is difficult to imagine a wood turtle study, even one preformed with scuba gear, as contributing useful ramping information. The Licensee needs to clarify how a particular study will be modified to

provide flow change data. Simply stating that a commonly required study is not needed, does not refute the need for a particular action.

**Section 6 Studies not Adopted**

**6.6 Fish Assemblage Study**

**The Sebago Lake Chapter of TU requested a fish assemblage study of each impoundment and riverine reach in the Ripogenus and Penobscot Mills Project areas speculating the following:**

My Response

In an earlier filing, MeDEP requested a fish assemblage study of the Ripogenus impoundment. In an earlier filing, I recommended collections of salmonid species from all project waters, thus I fully endorse MeDEP's and TU's requests. The MeDEP request referenced the West Branch below McKay Station and information on salmonid growth and abundance of one of Maine's premier riverine reaches is desperately needed. Forty year old data collected during periods of relatively stable flows has no value when present operations are now in a peaking mode and "rule curve" lake management no longer exists.

I am unsure of what a fish assemblage study involves. In my view, trap netting, electrofishing, hydro acoustics along with a few minnow traps will provide the necessary information. Lethal collections, wide mesh gill netting, is a choice of last resort and should be avoided. In order to identify the status of the Ripogenus Impoundment rainbow smelt population, the key element of the Ripogenus-West Branch salmonid fisheries, trawls, tows, hydro acoustics and fine mess vertical gill nets could be considered.

While implied, I saw no direct reference to Lake White Fish (*Coregonus clupeaformis*). This species was listed in Scooping document -2 and declining populations are the subject MeDIFW's concerns and goals. Thus, inclusion of Lake whitefish in a fish assemblage study is important.

**6.7 Creel Survey Study**

"*By letter dated November 9, 2021, Mr. Edward Spear requested GLHA conduct a creel survey on the West Branch of the Penobscot River. Mr. Spear requests that GLHA duplicate the 1978 study plans developed during the previous relicensing effort. GLHA acknowledges that creel survey data were collected and utilized during the previous relicensing, but it important to note that the 1978 study plans referenced by Mr. Spear were developed for the purpose of licensing and constructing a new dam ("Big A") on the West Branch of the Penobscot River downstream of the Ripogenus Project. Although these study plans were not developed for relicensing purposes, the resulting creel survey data were nonetheless utilized for relicensing due to the extensive fisheries data collection efforts associated with the Big A licensing effort, which preceded and led up to the Ripogenus Project relicensing.*

*While GLHA does not believe that creel data are directly applicable to FERC's NEPA analysis, MDIFW periodically conducts its own creel surveys, and plans to continue doing so. GLHA is not proposing the study request for the following reasons.*

***• Study request is not necessary because existing information is sufficient to answer the questions posed (Study Criteria No. 4) and/or the study request is an attempt to search for the existence of a "nexus" (Study Criteria No. 5)****:*

*As noted above, if a study request is an attempt to search for a Project effect, it does not meet FERC's criteria and it is not enough to speculate that a problem may exist or that the "evidence" of a problem is simply based on a "prediction based on opinions."*

*GLHA notes also that no federal or state fishery agency requested such a study, including MDIFW. In fact, MDIFW (letter dated October 10, 2021) explicitly states that:*

*"MDIFW concurs with the Licensee that there is an extensive history of inland fisheries studies associated with the Ripogenus Project completed in preparation for the 1996 license, and these studies need not be duplicated unless there are identified data gaps, or changes in operation that may impact the fisheries resources."*

*"MDIFW did not request creel surveys in their February 22, 2022. Given that the lead state fisheries agency in Maine has not requested creel data as part of the relicensing effort, GLHA does not believe this study is necessary."*

My Response

The licensee seems to take issue with the reasons for the 1979 Big A creel survey, implying the reason for the study, in some way, invalidates the results. In any event, the licensee overcame its concerns and continues with the old argument that 35-40 year old data are relevant and there are no needs for "new studies". The lack of current information is more than a "data gap", it is a black hole. The licensee continues with misrepresentation of the facts. "MeDIFW *periodically conducts its own creel surveys"* is simply incorrect in regard to Ripogenus and Penobscot Mill Projects riverine reaches. There have been no surveys of riverine areas in 35-40 years. Had MeDIFW conducted angler, fish collection or electrofishing surveys of West Branch riverine reaches, we would have seen the results. However, there have been winter surveys of both the Ripogenus and Penobscot Mills impoundment anglers. The Ripogenus survey is the most revealing as the adult salmon population has collapsed as well as the (juvenile) rainbow smelt population(s). Smelt "drift" though McKay Station provides a clear nexus to the downriver salmonid fisheries. The current status of all project tailwaters fisheries, including angler use and catch is relevant to the NEPA process as well as the Maine Department of Environmental Protections' "designated uses" and "anti-degradation" statutes.

The licensee claims that study criteria No 4 ***"there is no evidence of a problem"*** has not been met. A number of West Branch anglers have filed comments that indicate an opposite view. The Ripogenus salmon population is in decline. MeDIFW's recent smelt drift net collections below

McKay Station, while preliminary, indicate a precipitous decline in juvenile smelt, the principal salmon forage item. Beginning in 2019, I volunteered my service to the Greenville Regional office to collect lengths and scale samples from West Branch salmon. I fished at Nesowadnehunk Deadwater and Holbrook Pool, large salmon (>18 inches) were few. During my 25 year career of studying West Branch salmon, I measured and weighed hundreds of salmon. The fish I collected (approximately 150) during the 2019 – 2021 seasons were smaller in both size and weight than those of the 70's. 80's and 90's

Poor salmon growth, fewer smelt and angler complaints, how much more evidence of a problem is needed? This study proposal is not a result of speculation and it meets the change in project operations criterion. Additionally, how can MeDIFW possibly know that no studies are needed when all West Branch fisheries and aquatic communities data are, at a minimum, 30 years old? The MeDIFW position contradicts the draft 2021 Salmon Management Plan and makes NO SENSE.

Typically, the licensee is incorrect in regards to support for studies I have presented. The USFWS endorsed my study proposals in its February 22, 2022 filings. Also, to correct, the often inaccurate responses of the licensee, I asked for a creel survey, and suggested it follow the 1978 creel survey designed by MeDIFW and Great Northern Paper. When the Big A license application was withdrawn, the ongoing West Branch (in the tailwaters below McKay [and downstream to Pockwockamus Falls] and North Twin Stations) creel surveys were modified to meet relicensing goals and continued.

Demonstrating once again that the licensee has no idea of fish and aquatic resources management the licensee states "angler behavior" is not an action FERC can regulate. "Angler behavior" is a "term of art". The West Branch below McKay Station currently is managed by restrictive harvest regulations, thus the thought or idea of any "outside" management e.g., FERC, has no bearing on harvest of fish species, salmon in this case. Angler behavior simply refers to a number of variables; fishing gear (fly fishing, lure fishing, bait, etc.) and area (pool, rapids, etc.) is well as time (mornings, evenings, nights), season (spring , summer, fall) method (boat, drift boat, wade, or shore fishing). It is well known, that MeDIFW in conjunction with public hearings set Fish and Wildlife laws. To suggest otherwise seems to imply a naïve audience. However, MeDIFW can not manage its riverine fisheries resources without data. FERC and MeDEP also require current data to create licensing conditions that will ensure the process of balance between impoundment and riverine users e.g., boaters, anglers, campers, camp owners, sightseers and hydropower. Examples of such reasonable acts would be the requirement of higher minimum flows and stable base flows and stable impoundment elevations for all riverine and lacustrine areas.

Finally, the Licensee states that it may be in possession of new creel survey data. As I previously stated, I was unaware of any creel survey activity in the study areas, however I was aware of volunteer angler survey boxes. While I saw no licensee request for data, suddenly "current" MeDIFW creel survey data has become available. These are potentially important areas of

information and I hope the level of intensity and effort duplicates the effort used in the 1992 licensing. In any event, I welcome the licensee's change in strategy. *"GLHA has proposed to compile and synthesize fisheries data in the Ripogenus Project area, including any recent creel survey data that may not have been discovered during PAD development."* How can this happen after the license claim that they conducted an exhaustive search? "*…. GLHA, has undertaken an extensive effort to identify and review existing, relevant, and reasonably available information related to the Projects*" (PAD)? The 'open water' fishing season has been closed for six months, this can hardly be "new" information. Presumably the "new" creel survey information is from angler survey boxes, however "survey boxes" do not provide "creel survey data" in the true sense of the term. A creel survey is normally collected by a paid individual interviewing the fishing public. This passive survey box method depends on voluntary information and is known to be biased (technically called prestige bias, as successful anglers are more likely to fill in survey cards than angler who were unsuccessful). One would suspect that survey box information is even more biased as they were located near areas where angler and fish were concentrated. *The collection of these data will allow for a better understanding of angler success in the West Branch downstream of the Ripogenus Project*. It is impossible to agree or disagree with the licensee contention without first examining these data. Presumably these "new" data, if in fact they are from volunteer angler survey boxes will be provided in reviewable form. Thus, I hope these data are sorted by box location, fishing site, and date.

Regarding future creel surveys, it should be noted that each MeDIFW regional office each has hundreds of lakes and many hundred miles of streams and rivers to manage. MeDIFW offices have small staffs and many different mandates to follow. Their pride and effort in attempting to conduct exhaustive creel surveys in remote locations is a credit to their commitment to the resources. The 40 year old Great Northern Paper (GNP) creel survey data provided by the licensee was the result of 60-80 survey hours a week (see GNP creel survey records) during peak fishing seasons. Anglers fished early, many stayed well into the evenings, the effort to interview or enumerate anglers fishing in the McKay Station – Pockwockamus Falls river section is demanding, Even more demanding given the additional travel time between Greenville and Enfield offices and the Big Eddy or Debsconeag Deadwater. Future creel survey data collection should be robust rather a "snap shot" taken over a partial fishing season. Should MeDIFW attempt this difficult labor-intensive task, FERC should require the licensee to provide support.

If MeDIFW had important information, it should have been presented as preliminary yet to be analyzed data in the October 8, 2021 filing, to be later shared with the stakeholders. It would have also been more appropriate for MeDIFW to post any new data via an E-library filing rather than first consulting with the licensee. I understand anglers but I do not understand this process.

**6.8 Study to Determine Status of Impoundment Zooplankton Population and its Relationship to Larval and Juvenile Rainbow Smelt**

**Study request constitutes basic research and/or is not likely to inform the development of license conditions (Study Criteria No. 5):**

My Response

For lack of a better defense, the licensee rejects this study as **(Study Criteria No. 5)** basic research, despite referencing historic (1980-1984) zooplankton collections in the PAD's supporting documents. This simply is the licensee's opinion. This study request will provide the answers to most of the problems associated with the Ripogenus Impoundment and the downstream salmon fishery. The likely results of data provided by this study is that FERC/MeDEP will be able to prescribe enhancement and mitigation measures.

While the origin of Rainbow smelt is not important to the issue(s) concerning the Ripogenus impoundment smelt population, the Licensee continues to struggle with fisheries facts. According to the PAD (MDIFW 2021), rainbow smelt are an introduced species in the Project area, this is likely correct. However, in A-16 smelt are identified as an indigenous species, I believe this is probably incorrect. What I am certain of is that both propositions can not be correct. As this goes to "naturally occurring", the licensee needs to clarify which "smelt designation" is correct.

MeDIFW has identified a Ripogenus adult salmon population in collapse and linked it to smelt abundance. I agree with MeDIFW's assessment of the adult salmon population's decline but adamantly disagree as to the cause. Without current smelt and plankton data, any statement of the root cause of the reason(s) the Ripogenus salmon adult salmon population decline remains unknown. The preponderance of information found in the literature points to plankton as being the cause of (juvenile) smelt population(s) declines. If such a study designed to collect, enumerate and identify existing Ripogenus phyto and zooplankton communities and smelt populations is considered basic research, then what criterion/criteria separates "basic research" from routine monitoring? This study request involves inventorying the Ripogenus impoundment's phyto and zooplankton communities and smelt populations, a simple description of existing aquatic communities. The study request suggests multiple sampling event rather than a multiple year study. A quick look, what's there, what if anything, has changed? Very reasonable. FERC staff, not the licensee, should be allowed to decide if this proposed study meets study goal criteria.

The licensee has again misrepresented the facts. For 50 plus years the Ripogenus Impoundment's smelt population was "stable" and the salmon population thrived. This is no longer the case. While the licensee correctly notes the variability of smelt populations, they offer no proof e,g,, peer viewed publications, of a 15 year decline in other waters where smelt have no direct competition, e.g., alewives. Year class fluctuation is typically between alternate years.

The licensee cites the MeDIFW position that there is an overpopulation of landlock salmon in the Ripogenus Impoundment. That salmon are over-populating the impoundment is an

assumption/hypotheses. The more likely fact based on MeDIFW's 2021 West Branch drift net collections is that the plankton/smelt relationship has changed. For 50-60 years the Ripogenus salmon population was stable. Without Ripogenus smelt data, how can MeDIFW possibly state that there are too many salmon rather than too few smelt? FERC staff should consider the peer reviewed literature (see January 27, 2022 filing) and the importance of Ripogenus smelt populations(s) and act accordingly.

The licensee also quotes a MeDIFW report that many lakes are overpopulated with salmon. This is true in some cases but the licensee's rebuttal, as in many cases, misses the point. Are any of the MeDIFW referenced lakes, historically famous for their salmon fisheries, witnessed a collapse of the fishery that lasted for perhaps 15 years? For lakes that are overpopulated by salmon, what is the condition of the smelt population? In fact, how many of the lakes in question have smelt populations.? How many of the referenced lakes are managed by stockings? As has been the cases in many of the licensee's objections, they do not back up their criticism with data or peer reviewed studies.

In setting up its legal defense, for circa 2026, the Licensee argues that any phyto or zooplankton study would be inconclusive. These data must be of important as the licensee included 1980-1984 zooplankton data in its 2021 filings. How can the licensee state the data are inconclusive before the study is completed? Rather than speculate about the results, why not find individuals more expert than me along with FERC staff to judge the value/relevance of these yet to be collected data. Clearly, evaluating the plankton/smelt community will provide data on which FERC/MeDEP can require PM&E measures.

7.1.4 Riverine Aquatic Habitat Assessment

In its October 8, 2021 filing MeDIFW (Study Request 10) commented on macro invertrabrate sampling in the Ripogenus Impoundment and in the downstream West Branch. *"We recommend the sampling take place in the same locations in the Ripogenus impoundment and the section of river between McKay Station and Ambajejus Lake".* However, the licensee's proposal is diabolically different from the MeDIFW study request. The Licensee is proposing reduced sampling and at one site, that location is not representative of the 20 mile downstream river reach.

The licensee is proposing to set up macro invertrabrate sampling immediately below McKay Station, the Millinocket and Dolby Dam Faculties. Such sites are not representative of downstream reaches and are thus not acceptable. During construction, In order to reduce tailwater elevation immediately below turbines at each station, ledge and rocks were moved to produce high exit velocities. These necessary engineering measures produced 300- 500 yards of what in effect are open culverts. The resulting habitat is not representative of downstream habitat and in fact, velocities and substrates below McKay are so extreme salmon are unable to overwinter in this same area that supports an extremely high quality "summer" salmon fishery. The licensee mentions safety measures, thus is obviously aware of this extreme and unnatural

environment. When the Maine legislature approved of water quality designation standards such as “naturally occurring” and agencies developed a 75% zone of passage criterion it is unlikely draft tube discharge areas were considered as sampling sites. “Naturally occurring” automatically dismisses such areas. It is clear that legislature and agency’s standards were NOT intended to be applied to what in reality are human construction excavations that produced high velocity open culverts

Macro invertrabrate sampling should not simply be “pro forma”, rather it should produce actionable information. There are indications the macro invertrabrate populations, namely Ephemeroptera, Plecoptera, and Trichoptera (EPT) have decreased in recent years in the waters downstream of McKay Station. MeDIFW commented on the reduced “hatches” of adult mayflies and stoneflies and caddis moths in its October 8, 2021 filing. Life stages of all EPT are important to salmon of all year classes and critical to adult salmon during the summer maintence period. A study site located in the upper 1000 ft of the West Branch is not indicative of conditions in the remaining 20 plus miles of river. A number of historic, 1980s, study sites are shown in the Ripogenus Project Application, any of those sites are more representative of substrates, flow and depth than the high velocity steep sided area immediately below McKay Station. Penobscot Mills study sites are included in the 1991 FERC Application. Any macro invertrabrate site(s) should be representative of the river populations and comparable to historic population(s) abundance(s) and distribution.

It appears that the licensee is proposing one macro invertrabrate station “with three replicate samplers downstream of McKay Station”. If this is the case, I strongly object. FERC should listen to MeDIFW and execute their very reasonable request.

**Appendix B West Branch Channel Study Plans**

**2.0 Goals and Objectives**

*The goal of this study is to assess the relationship between flow and aquatic habitat in the West Branch below Stone Dam using a standard and accepted methodology, such as the Instream Flow Incremental Methodology (IFIM). GLHA understands that MDIFW’s primary interest is the effect of flow on habitat for coldwater fisheries, in particular brook trout and landlocked salmon, and the potential for a seasonal put-and-take fishery*.

The West Branch Channel (Backchannel) has been dewatered for approximately 120 years. For the last 30 plus years, the cause of dewatering was economic concerns, e.g., the loss of Millinocket Mill jobs (see 1996 EIS). It is time for FERC to restore the balance between environmental and recreational goals, the local “recreation based” economy and the need for power generation.

While landlocked salmon are referenced RSP West Branch channel study plans, there is no mention of life stage. The importance of all salmon life stages needs to be included and

evaluated in any study. Study sites need to representative of substrates best suited for juvenile salmon productions rather than a short-term put-and-take hatchery brook trout population.

The licensee currently supports a “put and take” brook trout fishery in Millinocket Stream. This stream parallels the Grindstone Road and provides easy access to the stocking truck as well as anglers. The Millinocket Stream put and take fishery seems to be producing the desired results.

In the eagerness to propose a West Branch “put and take” trout fishery, MeDIFW and the licensee have failed to produce a few details; angler demand, access and logistics. Presently vehicle access to the old river channel is blocked by fencing and the only possible access is via boat. More importantly, access along the channel is via an old road on the Western side of the river, the old CCC trail, this is only usable by four wheel drive vehicle, and reachable only by crossing the West Branch and then only during “no flow events”. Thus, to make a “put and take” fishery work, a bridge across the channel (that would survive PMF flows) or a road down the eastern side of the river will be required. A “field of dreams” argument is not acceptable. The Licensee and MeDIFW need to explain how dependable streamside access will be provided to the hatchery truck and anglers and the capital and maintenance costs of these necessary actions.

Circa 1994, I received a call from Mill security notifying me of salmon trapped below Stone Dam following a late Spring/early summer spill event. We loaded the electrofishing gear and drove to Stone Dam where we removed 40-50 adult salmon (see Great Northern Papers files). This event, along historic angler reports, is evidence of salmon responding to high flows and the natural tendency to “drop” downstream. Thus, salmon will always enter the West Branch Channel during high flow events, the remaining question is the provision of an appropriate flow.

Additionally, salmon anglers have demonstrated a willingness for long boat trips to fish for legal sized landlock salmon in riverine environments. As shown in the Ripogenus and Penobscot Mills Projects Appendices, anglers cross Pemadumcook Lake to fish Nahmakanta Stream, Ambajejus Lake to fish the West Branch, and Chesuncook Lake to fish the Upper West Branch, when quality salmon fishing opportunities exist. Thus, the development of the West Branch channel as salmon habitat will produce salmon spawning and nursey habitat as well as an opportunity to catch legal size salmon (1996 EIS). Thus, developing the West Branch as salmon habitat meets multiple MeDIFW goals. Watering the West Branch channel represents passive management as no roads or bridges or hatchery trucks are required. In addition, West Channel flows will provide excellent canoeing and kayaking opportunities. The trip from North Twin (Rt 11) downstream to the Dead Man’s Curve is approximately eight miles.

**3.0 Resource Management Goals**

*While MDIFW generally manages Penobscot Mills Project waters for coldwater fish, the agency does not have a fishery management plan that includes explicit goals for management of the West Branch below Stone Dam. However, in their October 8, 2021 letter, MDIFW outlined their*

*current fishery management interests in the West Branch below Stone Dam: Due to changing MDIFW fisheries goals and growing angler pressures in the region, MDIFW is trying to establish a seasonal put-and-take fishery in this resource [West Branch below Stone Dam] to provide more angler opportunities. Given changing MDIFW management objectives for this resource since the original license was issued, MDIFW requests that minimum flows be re-evaluated at the [West Branch below Stone Dam] (MDIFW 2021a).*

IN my January 7, 2021 filing I requested MeDIFW evidence of ***"growing angler pressures in the region"*** to date***,*** none has been provided. Thus, the MeDIFW statement stands as an opinion, based on little or no information. Having reviewed countless comments concerning my fact based filings, called opinions by the licensee, it is difficult to understand why some opinions are valued to the extent of providing study justification, while others are not.

While there may be angler demands to catch ten inch hatchery trout, there is a documented needed for riverine salmon fishing opportunities. The licensee and MeDIFW appear to reject practical fisheries goals. MeDIFW is setting up arbitrary, unsupported fisheries management objectives. One of the suggested "study species" is brook trout, a species requiring little or no flow, this fits well with licensee's goals of limiting flow in the West Branch Channel. The MeDIFW proposal "flies-in-the face" of MeDIFW stated policy. From the 2021 draft MeDIFW salmon management plan and the PAD (5.4.1.1) the current salmon management includes;

- statewide management goals for landlocked salmon are to maintain the current distribution of principal fisheries for landlocked salmon, provide for a diversity of fishing opportunities, maintain and where possible expand the contribution of wild salmon to the population

The 2022 plan adds;

Maintain or enhance existing (salmon) populations *(High Priority)*

*"Identify potential strategies—including regulation, partnerships, habitat modification, ….."*

*Maintain healthy and sustainable landlocked Atlantic salmon fisheries*

*"Advocating for in-watershed land and water management practices that maintain or enhance spawning and rearing habitats for wild populations, where populations are not over abundant,"*

<u>The West Branch channel or Back Channel provides an excellent opportunity to create a self-sustaining salmon fishery and accompanying juvenile production</u>.

The 1996 EIS examined the West Branch (AKA Back channel) at a variety of flows before bowing to the economic needs of Great Northern Paper. That concern no longer exits. FERC Staff analyzed Back Channel adult salmon habitat at a 350 cfs flow. They wrote that the "*approximately 245, 3-year-old fish would be produced over the 4.5 mile reach. The estimated 245 adult salmon in the back channel represents only 61 fish per mile per mile, well below the*

*state standard of 83 fish per mile per year required for moderate quality fisheries (DIFW 1991)"*. The actually length of potential riverine salmon habitat between Stone Dam and Shad Pond is approximately three miles. Additionally, Shad Pond, below Grand Falls, provides downstream overwintering habitat. The number of 3-year-old salmon (used in the FERC analysis) is approximately 383 adult salmon as that age class is carried though its life expectancy (assuming 40% survival to age V). Thus, if the corrected 383 number of salmon is divided by the actually length of salmon habitat (3 miles), then the product far exceeds MeDIFW goals. This is even better given today's anglers catch and release trend, where fish caught and released, and caught again, the effective catch would be around 700 fish. Pretty good fishing. Ultimately, FERC staff demised and Back Channel flows citing the loss of 240 Mill jobs. There is no longer a Mill and no longer any need to protect jobs and West Branch Channel is needed to mitigate lost North Twin tailwater juvenile salmon production and to supplement the downstream Millinocket facility salmon population as well as providing fishing opportunity.

The licensee and MeDIFW appear to reject practical fisheries goals. MeDIFW is setting up arbitrary, unsupported fisheries management objectives. One of the suggested "study species" is brook trout, a species requiring little or no flow and NO stream velocity, this fits well with licensee's goals of limiting flow in the West Branch Channel. The MeDIFW proposal "flies-in-the face" of stated policy. From the 2021 draft MeDIFW salmon management plan and the PAD (5.4.1.1) the current salmon management includes;

- statewide management goals for landlocked salmon are to maintain the current distribution of principal fisheries for landlocked salmon, provide for a diversity of fishing opportunities, maintain and where possible expand the contribution of wild salmon to the population

The 2022 plan adds;

Maintain or enhance existing (salmon) populations *(High Priority)*

*"Identify potential strategies—including regulation, partnerships, habitat modification, ….."*

*Maintain healthy and sustainable landlocked Atlantic salmon fisheries*

*"Advocating for in-watershed land and water management practices that maintain or enhance spawning and rearing habitats for wild populations, where populations are not overabundant*".

The Great Northern Paper mills are no longer operating and the local economy has become dependent on recreational activity. A West Branch channel salmon fishery would provide fishing opportunity, salmon nursey habitat as well boating activities for canonist and kayakers. FERC staff should consider practical fishery management options that meet multiple goals that balance environmental and recreational needs with power generation.

**Studies Suggested in the Comment Period but not Addressed in the Revised Study Plan**

Minimum operating flows below McKay Station

During the recently closed commenting period, I submitted a February a 22, 2022 filing that dealt with West Branch low or minimum flow periods below McKay Station. MeDIFW referenced flow issues in its October 8, 2021 filing;

*"An evaluation of minimum flow provisions is necessary to determine how best to meet the various resource needs including those of the Licensee, which may not be consistent among the various agencies and other interested parties. These data will inform conclusions regarding impacts to aquatic habitat to determine whether modifications to Project operations are needed. Data derived from this study will facilitate evaluation of the existing minimum flows, inform MDIFW's decision process, and contribute to the development of an administrative record in support of protection and enhancement opportunities for freshwater fisheries and the aquatic community at large."*

No attempt was made in the RSP to address the biological impacts resulting from daily flow reductions to outflows of 1000 cfs. The licensee has changed operation to a peaking regime where typical 2021 summer flows were increase to 3000 cfs in the morning and reduced to 1000 cfs in the evenings. Such operations result in devastating impact to fish and aquatic communities. This flow regime and the current operating minimum needs to be addressed and if needed corrected.

The present licensed McKay Station minimum flow was set in 1996 when Great Northern Paper Mills were still operating. Mill production was running 24X7X365 and daily major flow reductions were never a major consideration. Thus, a minimum flow standard was developed based on the assumption that any minimum flow would only be needed in maintenance emergencies or Mill production crisis. Initially the USFWS generic flow prescription of one cfs/square mile (1455 cfs) was set as minimum a flow, this was later reduced to 1300 cfs and finally to 1000 cfs; a flow based on McKay Station optimal turbine efficiency. Historic flow records available during 1992 licensing supported this stakeholder decision. That was then, this is now.

The 2021 August-September overnight flow reduction impacted a litany of guilds;

* The most obvious impact was the daily evening dewatering of the Holbrook bypass channel, see Article 406 of the 1996 401 WQC. This spawning and nursey area habitat modification was requested by MeDIFW to enhance young-of-the-year (YOY) juvenile salmon production, the salmon life stage considered to be limiting the abundance of salmon in the West Branch. Nightly dewatering of this critical enhancement measure eliminated any significant contribution YOY and parr to the West Branch adult salmon population. Nightly dewatering also threatened the limited downstream salmonid nursey areas.

* Less visible are the impacts on all life stages of salmonids, the sudden change in flow can result in stranding and in all cases require to move to adjust to changing depths, velocity.

Additional, energy is required to constantly find new micro habitats, this movement increases predation and reduces “feeding” time.

* Less Visible are the impacts to macro invertrabrate communities. Aquatic insects are vulnerable to dewatering and desiccation, additionally trichopteran species such as the Hydrophyscid family loss the ability to construct nets and gather food during up and down flow events.

* More visible is the impact on anglers who are forced to move (as do the fish) and change their fishing position in response to flow changes. No only do anglers have to move but they also have to guess where the fish have moved to.

There is a clear need to develop an operational minimum flow that is based on biological needs of fish and aquatic communities. Genetic flow prescriptions, Tenant, ABF, Montana, 7Q10, etc. that look only at past hydrology i.e., flow records, are inappropriate for low flow operations that occur daily. Daily/weekly/ monthly flow requirements for litany of fish and aquatic species change throughout the five to six month growing season. There is a clear need for instream flow studies that addresses the dynamically changing flow and habitat needs of fish and aquatic communities. There is not “one flow prescription fit all” scenario.

**Upper Gorge flow Studies**

The impact of temperature differnces between deep gate and log sluice flows into the Upper Gorge during the July 1 to September 30 enhancement period need to determined and cool attraction flows into the Upper Gorge need to be provided.

In his October 8, 2021, filing Paul Johnson, the former senior Biologist at the Greenville Regional Office, and principal MeDIFW representative during the Ripogenus Licensing provided the following comments and request, and MeDIFW echoed these concerns its October 8, 2021 filing;

*“Flows in the Upper Gorge between Ripogenus Dam and McKay Station have not met the objectives for this section of river for the past 25 years! Article 401 of the current license requires a July 1 - September 30 discharge of 100 cfs into the Upper Gorge to provide a cool flow that would attract adult salmon and increase fishing opportunity in the gorge during this period. The recommendation for this flow and its timing was based on observations in years prior to the 1990’s, when minimum flows discharged to the West Branch with McKay Station shut down were provided through a deep gate in Ripogenus Dam – hence the cool water. Unfortunately, for the past 25 years the 3-month discharge has been through a small sluice gate that provides warm, surface water to the Upper Gorge, defeating the purpose of Article 401 – 25 years of lost mitigation/enhancement. I recommend 1) studies to determine an appropriate annual minimum flow for the Upper Gorge, and 2) that a new license contain a condition requiring that the 1 July 1 – September 30 flow in the Upper Gorge be provided through a deep gate in*

*Ripogenus Dam, or through an alternative to a deep gate that will provide at least 100 cfs from deep water, not surface water, in Ripogenus Lake."*

In its October 8, 2021 filing MeDIFW stated; *"It was the intent of MDIFW that the flows in the Upper Gorge would originate from a deep gate and therefore provide a cool water attraction flow as adult salmon reached the upper river in July. However, the water is released from a sluice (surface) gate which is warm water. This water is warmer than the water passing through McKay Station into the river and is therefore ineffective as an attraction flow. We request Brookfield develop a plan to provide a 100 cfs flow from July 1 to September 30 into the Upper Gorge from below 45 feet (summer thermocline location) in the impoundment to fulfill the original intent of this mitigation and provide additional fishing opportunities."*

The Licensee has not followed up on this simple MeDIFW request. The placement of a recording thermometer extending a meter or two into the impoundment can easily correct part of this oversight and provide a contrast between water surface, and mixture of "epilinnetic/thermocline" flows, or sub surface waters discharged from the McKay Station turbines. Temperature data will provide answers as to the most appropriate methods (deep gate, siphon, etc.) to cool Upper Gorge summer flow.

This filing represents a multitude of concerns and study suggestions. I hope that FERC staff will give the above pleadings careful consideration and require the studies necessary to produce current information on the fisheries and aquatic communities so critical in all project water.

Thank you

Edward Spear
307 Mt Hope Ave.
Bangor, Me 04401
Email; edspear1@yahoo.com

FEDERAL ENERGY REGULATORY COMMISSION
Washington, DC 20426
April 7, 2022

OFFICE OF ENERGY PROJECTS

Project Nos. 2572-133 & 2458-247 –
Maine
Ripogenus Hydroelectric Project
Penobscot Mills Hydroelectric Project
Great Lakes Hydro America, LLC

**VIA FERC Service**

Julie Crocker
Protected Resources Division
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930

**Reference: Response for Extension of Time to File Comments on Revised Study Plan**

Dr. Ms. Crocker:

On March 23, 2022, Great Lakes Hydro America, LLC (GLHA) filed its Revised Study Plan (RSP) for the Ripogenus (P-2572) and Penobscot Mills (P-2458) Projects. In response, the National Marine Fisheries Service (NMFS) requests that the Commission grant a 60-day extension of time to file comments on the RSP (to June 6, 2022) to allow for a review of the 10 years of operation data filed with the RSP. NMFS indicates that this information was filed late, and the agencies and stakeholders now have only 15 days to review and comment on the data. NMFS states that the additional 60 days is needed to afford the agencies and stakeholders time to review the operations data and factor it into their responses to GLHA's RSP.

On October 8, 2021, Commission staff requested that GLHA provide 10 years of operations data to, among other things, document the Projects' operations, as described in the Preliminary Application Document. This information was to be provided as part of the GLHA's Proposed Study Plan (PSP). However, the requested data was not included in the PSP, but instead was, as noted above, filed as part of the RSP. Because documenting how the Projects operate could guide study design, additional time to review the requested data is reasonable. However, an additional 21 days, rather than 60 days, should be sufficient to review the data and incorporate it into responses on GLHA's

RSP, while avoiding delays in any required studies this field season.[1] Therefore, comments on the RSP are now due by April 28, 2022, and the due date for the Study Plan Determination (SPD) is May 13, 2022.

If you have any questions regarding these matters, please contact Allan Creamer at (202) 502-8365, or allan.creamer@ferc.gov.

Sincerely,

Vince Yearick
Director
Division of Hydropower Licensing

Cc: VIA Electronic Mail

Mr. Dan Kircheis
National Marine Fisheries Service
Dan.Kircheis@noaa.gov

[1] Pursuant to section 5.29(f)(2) of the Commission's regulations, sections 5.13(b) and 5.13(c) are waived to provide additional time to file responses to the RSP and the Director of the Office of Energy Projects (Director) to issue the SPD.

**Filed via "eFiling"**

April 7, 2022

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Division
888 First Street, N.E.
Washington, D.C. 20426

**RE: Comment on RSP, Ripogenus Project (FERC No. 2572) and Penobscot Mills Project (FERC No. 2458)**

Dear Secretary Bose,

The Bureau of Parks and Lands (BPL) submits the following comments in response to the filing of the Revised Study Plan (RSP) for the Ripogenus Hydroelectric Project and Penobscot Mills Hydroelectric Project (FERC Project Nos. P-2572, P-2458) by Great Lakes Hydro America, LLC ("GLHA" or "licensee"), to inform FERC's development of the Study Plan Determination.

BPL participated in the initial scoping meeting, submitted PAD comments as well as study requests for these projects; and commented on the licensee's Proposed Study Plan. We file these comments to address remaining deficiencies in GLHA's RSP, to voice support for related comments by other stakeholders in the FERC relicensing, and to help ensure robust data is obtained to adequately understand the recreational impacts of project operations within and adjacent to the project boundary.

Revised Study Plan, Appendix F – Recreation Study Plan
*7.3 Recreation User Survey*
The licensee proposes to administer the recreation user survey via kiosks at FERC-approved Project recreation sites (with a QR code to permit visitors to complete the survey electronically if they prefer). BPL is concerned that this method will under-represent or perhaps exclude the users of the 10 Chesuncook Lake remote campsites. The understanding of BPL staff at the Penobscot River Corridor (PRC), who manage the sites, is that most campers using those campsites launch and/or take-out from the lake at one of the following two sites, neither of which is included among the FERC-approved recreation sites as listed in the Study Plan:

1) Umbazooksus West boat launch -- only the campsite at this location is included in FERC-approved recreation sites; the Bureau questioned this in our prior comments because the 2008 Recreation Facility Report for the projects submitted to FERC (GLHA 2009, as referenced in the PAD) lists Umbazooksus Stream as a public boat launch. Per the Study Plan, campsites will not be included in the recreation user survey.

2) Graveyard Point boat launch -- informal gravel launch at Chesuncook Village, on BPL property and managed by the PRC. Access road improvements in recent years have made this a more attractive option for Chesuncook campsite users and other boaters.

We are also concerned that campowners on Chesuncook Lake will not be included in the survey without traveling to one of the FERC-approved recreation sites. To address these concerns, we request that the recreation user survey methodology be expanded to include an on-line survey (and the means to alert the visiting public to it) and stakeholder focus groups, to include campowners. We support the similar request by AW and AMC in their comments on the RSP, and also their request that the scope of the study include all informal recreation sites as well as those recreation sites located near and adjacent to the projects. Including informal sites would encompass the above two sites on Chesuncook Lake.

The Bureau offers GLHA assistance in informing the visiting public of the opportunity to participate in an on-line recreation survey, and in distributing the survey electronically.

Revised Study Plan, Appendix H – Aesthetics Study Plan
*6.0 Methodology*
GLHA has adopted the Aesthetic Resources Study requested by several stakeholders, and we believe the proposed study will provide useful and valuable information regarding the aesthetic impacts of the project. However, as expressed in our previous comments, we are interested in documenting the aesthetic impact of impoundment drawdown at the Ripogenus impoundment (Chesuncook Lake) and are concerned that the proposed study will not fully capture this. We believe that the substantial amount of drawdown at Chesuncook Lake may have an important effect on the enjoyment of boaters on the lake and users of the remote boat-in campsites. The 2010-21 operations data provided in Appendix S of the RSP indicates a drawdown of 20 feet or more below full pool occurs most years.

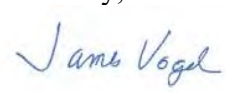
Therefore, BPL requests that the Aesthetics Study specifically address views of the lake and surroundings as experienced by boaters from the lake surface as well as from FERC-approved recreation sites (as GLHA intends to do as described in the Aesthetics Study methodology, page H-6). Specifically, several representative locations on the lake surface should be added to the list of Key Observation Points.

*Also: Recreation Study, 7.3 Recreation User Survey & Attachment 1*
To address the same concern, the Bureau also recommends that the recreation survey instrument, provided as an attachment to the Recreation Study Plan, be modified to directly address the issue of the effect of drawdown on aesthetics and visitor enjoyment. The survey instrument includes a general question (#15. "What did you "like least" about your recreational experience today?") that may solicit responses on adverse conditions such as severe drawdown, but that does not

probe the issue directly, as we believe is needed. This comment pertains only to the Ripogenus Project.

Thank you for the opportunity to submit these comments. Please feel free to contact me at (207) 287-2163 or via email at Jim.Vogel@maine.gov if you have any questions regarding these comments.

Sincerely,



James Vogel, FERC Coordinator
Bureau of Parks and Lands

Cc: Andrew Cutko, Director, Bureau of Parks and Lands
John Perry, Maine Department of Inland Fisheries and Wildlife
Randall Dorman, Brookfield Renewable

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JANET T. MILLS
GOVERNOR

April 7, 2022

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

RE: Comments on the Revised Study Plan for the Ripogenus (FERC No. 2572) and Penobscot Mills (FERC No. 2458) Hydroelectric Projects

Dear Secretary Bose:

The Maine Department of Environmental Protection (Department) received and reviewed the Revised Study Plan (RSP) submitted on March 23, 2022, by Great Lakes Hydro America, LLC (Great Lakes, or Applicant), for the Ripogenus and Penobscot Mills Hydroelectric Projects (Projects), located on the West Branch of the Penobscot River.

The Projects are subject to water quality certification provisions under Section 401 of the Federal Water Pollution Control Act (a.k.a. Clean Water Act). By Executive Order of the Governor of the State of Maine, the Department is the certifying agency for water quality certifications.

Fish Assemblage Study

In its comments on the Proposed Study Plan, the Department requested a Fish Assemblage Study that would be used to demonstrate, in part, whether the Projects meet applicable water quality standards. Specifically, the impounded waters must support all species of fish indigenous to those waters. The results of the Fish Assemblage Study would also be used as evidence that could demonstrate attainment of the designated use of habitat for fish and other aquatic organisms.

In the RSP, Great Lakes does not adopt the Department's requested Fish Assemblage Study, and instead proposes to conduct a Fishery Assessment as part of the Impoundment Aquatic Habitat Assessment component of the Water Quality Study. The Fishery Assessment would not involve any scientific sampling of fish populations. Instead, it would rely on existing information and interviews with various parties.

Although Great Lakes did not directly address the Department's request in its rationale for not adopting the Fish Assemblage Study, it did address a similar study request from a stakeholder group. Great Lakes appears to base its decision not to adopt the Fish Assemblage

AUGUSTA
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
(207) 287-7688 FAX: (207) 287-7826

BANGOR
106 HOGAN ROAD, SUITE 6
BANGOR, MAINE 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, MAINE 04103
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04769
(207) 764-0477 FAX: (207) 760-3143

website: www.maine.gov/dep

Study on its assertions that existing information is sufficient [section 5.9(b)(4)], that study results are not likely to inform potential license conditions [section 5.9(b)(5)], and that the study methods proposed by the stakeholder group (gill netting) are not consistent with generally accepted practice in the scientific community [section 5.9(b)(6)].

The Department disagrees with Great Lakes' assertions. First, existing information would not be sufficient to demonstrate that the Projects are currently meeting water quality standards. Historical and anecdotal data could be useful for fisheries managers, but it is unlikely to provide sufficient, defensible data for the Department to determine that the Projects' currently support all indigenous species of fish. Comprehensive, scientific sampling of fish populations would provide sufficient data to draw conclusions about the Projects' effects on water quality [section 5.9(b)(4)]. Second, the results of a Fish Assemblage Study would directly inform potential conditions that the Department could require in any Water Quality Certification it would issue for the project. Study results would be used to demonstrate attainment of water quality standards related to fish populations in addition to providing evidence that the Projects meet water quality standards related to aquatic habitat more generally. If evidence of nonattainment is found, the Department will use the study results to inform the development of measures to mitigate for the Projects' effects on water quality. This is critically important to the relicensing proceeding, because FERC must include Water Quality Certification conditions in any new licenses for the Projects [section 5.9(b)(5)]. Third, the Department did not provide specific methods in its request since this type of study is commonly conducted in many FERC relicensing proceedings. Great Lakes' response focused on their concerns with the stakeholder group's proposed methods for collecting fish samples (gill netting). Great Lakes did not discuss any other generally accepted, and more commonly used, practices that the scientific community typically uses in fish assemblage studies, such as electrofishing. Due to this omission, Great Lakes' response did not fully address the study criteria, nor does it provide a basis for Great Lakes to not adopt the Department's requested study [section 5.9(b)(6)]. For these reasons, the Department requests that FERC determine that Great Lakes must complete a Fish Assemblage Study.

Thank you for the opportunity to review and comment on RSP for the Ripogenus and the Penobscot Mills Hydroelectric Projects.

Sincerely,



Kyle Olcott
Hydropower Coordinator
Department of Environmental Protection

JANET T. MILLS
GOVERNOR

STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
353 WATER STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041

JUDITH CAMUSO
COMMISSIONER

***Via Electronic Filing***

April 7, 2022

Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

**Re: MDIFW Comments on the Revised Study Plan for the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458)**

Dear Secretary Bose:

On March 23, 2022, Great Lakes Hydro America, LLC (GLHA), a subsidiary of Brookfield Renewable (Brookfield, Licensee), submitted their Revised Study Plan (RSP) for both the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458). The Projects are located on the West Branch of the Penobscot River and Millinocket Stream, and span both Piscataquis and Penobscot Counties, Maine. The Maine Department of Inland Fisheries and Wildlife (MDIFW) provides the following comments.

## Fisheries

### *Ripogenus Project*

MDIFW originally requested a macroinvertebrate study of the Ripogenus impoundment, as well as in the river below McKay Station. Our request is satisfied by the proposed Water Quality Study Plan as outlined in Appendix A.

We also expressed concerns over the following:

1. The lack of cold water in the attraction flow in the Upper Gorge. These attraction flows were required in the previous license and intended to provide cold water attraction for salmonids. This concern is addressed in the Water Quality Study outlined in Appendix A.
2. Reduced boat access due to low summer lake elevations. This concern is addressed in the proposed Recreation Study Plan.
3. The apparent change to peaking flows through McKay Station causing disruptions in the fishing and macroinvertebrate populations in the river. The macroinvertebrate concern (MDIFW's Study Request 10: Macroinvertebrates Study Request—Ripogenus Project) will be addressed in the proposed Water Quality Study. We request that an analysis of hourly flows be included in the proposed Historical

PHONE: (207) 287-5254 FISH AND WILDLIFE ON THE WEB: www.maine.gov/ifw EMAIL ADDRESS: IFWEnvironmentalreview@maine.gov

Operations Data Assessment so we may determine the degree and frequency of peaking flows in the river. We believe there is adequate information in the literature to assess impacts.

4. The loss of fishing sites at McKay Station due to fencing installed by GLHA. This concern was not addressed in the Revised Study Plan and should be added to the Recreation Study Plan. GLHA should enumerate the number of fishing sites used by anglers during spot checks.

GLHA states that they will work with the Maine Department of Agriculture, Conservation and Forestry and MDIFW to obtain both commercial and private whitewater boating registration data collected at McKay Station as part of the proposed Recreation Study Plan. We request that GLHA include an analysis of daily whitewater registrations by weekday for each month from May through September. Specifically, we would like to be able to determine the total number and percent of use on each weekday (For example, X number of people (representing X percent of the total use) is occurring on Mondays in May, etc.)

***Penobscot Mills Project***

As initially described in our initial Study Request 8: Landlocked Salmon Habitat Use/Spawning Study, and as reiterated in our February 22, 2022 comments on the Proposed Study Plan, MDIFW continues to recommend a landlocked salmon radiotelemetry tracking study be conducted in the North Twin impoundment. The goals and objectives of this study include:

- Track seasonal movements and behaviors of landlocked salmon (within and between the five connected lakes) via radiotelemetry.
- Determine the effects of annual Project drawdowns on the movement and behaviors of landlocked salmon within the North Twin impoundment.
- Identify landlocked salmon spawning areas within the North Twin impoundment.

It remains unknown what affect Project operations have on landlocked salmon spawning movement and behavior on selection of spawning tributaries in the North Twin impoundment. It is generally accepted that salmon utilize large inlets and outlets for spawning and rearing[1]. However, it has also been documented that salmon will spawn in lakes, especially near mouths of large inlets, in moving water near outlets, and among wind-swept shoals[2]. The Licensee's proposal to conduct a tributary access study without radio tagging salmon would not identify spawning activity within the lacustrine habitat of the North Twin impoundment. Additionally, any salmon movement into the outlet during the fall spawning period would not be documented. Outlet flows of the North Twin impoundment are controlled by the Project's North Twin Dam and could have an effect on spawning timing and success. Radio-tagged salmon would identify

[1] Boucher, David and Warner, Kendall, "Maine Landlocked Salmon : Life History, Ecology, and Management" (2006). Inland Fisheries and Wildlife Documents. 65. https://digitalmaine.com/ifw_docs/65

[2] Maine Department of Inland Fisheries and Wildlife; Warner, Kendall; and Havey, Keith A., "The Landlocked Salmon in Maine: Life History, Ecology and Management of Maine Landlocked Salmon" (1985). Inland Fisheries and Wildlife Documents. 64. https://digitalmaine.com/ifw_docs/64

potential salmon movement into the outlet and the efficacy of the North Twin Dam fishway to pass salmon back upstream into the impoundment after spawning.

## Wildlife

### *Common Loon Productivity Assessment (Penobscot Mills)*

The Licensee believes that the Historical Operations Data Assessment Study will provide information on how the Penobscot Mills Project has been operated over the term of the existing license, including impoundment elevations during the loon nesting season. Additionally, GLHA proposes to utilize the Operations Model Study to evaluate alternative operating scenarios (including the resulting impoundment elevations) to be considered for the new licenses, which will be compared to historical operations data to understand if changes in operation may be affecting nesting loons on the Millinocket Lake and North Twin impoundments.

MDIFW supports this approach; however, we reserve the right to reiterate our request for an assessment of common loon productivity at these impoundments.

### *Wood Turtle*

MDIFW appreciates GLHA's cooperation in assessing potential impacts to wood turtles as a result of Project operations and supports the proposed phased study approach. Given the vastness and remote nature of the Project area, prior to any Phase 1 (and Phase 2, if necessary) field work, we recommend that GLHA work with MDIFW to ensure that final field study methodology and objectives are mutually agreed-upon.

### *Furbearer Study*

Based on conversations with MDIFW, GLHA has adopted a Furbearer Survey Study at the Ripogenus Project; however, this study has been modified from our original October 8, 2021 Study Request.

We want to emphasize that detection of both beavers and muskrats can be difficult: this is especially true for muskrats, which can live in the most discrete places making detection extremely difficult for any furbearers residing in bank dens and backwaters. Based on the experiences of MDIFW regional wildlife biologists, oftentimes muskrats live in bank dens and often require a fairly high level of effort to detect, making detection by observers in a boat unlikely. We stress that the level of effort necessary for this study will require observers traversing, by foot, areas of backwaters, shallow coves, and other sites where a boat may not be able to travel.

### *Littoral Zone/Macroinvertebrates*

In our October 8, 2021 PAD Comments and Study Requests, MDIFW recommended Study Request 2: Exposed Aquatic Habitat Assessment, which has been adopted by GLHA as part of their proposed Riparian and Littoral Habitat Assessment Study Plan. The goal of Exposed

Aquatic Habitat Assessment is to quantify the total area of exposed aquatic substrate of all waterbodies comprising both the Ripogenus Project and Penobscot Mills Project. The assessment should consider exposed substrate, relative to the full pond elevation of each waterbody, during three scenarios:

- 10-year average annual drawdown for each waterbody
- low-water years for each waterbody, using 2021 water levels
- under maximum allowable drawdown for each waterbody

Additionally, we requested a quantitative assessment of exposed aquatic substrates in the downstream riverine ecosystems for each project, including analyses of both the mainstem West Branch downstream of Quakish Lake ("Back Channel") and Millinocket Stream.

In Table 1-1 of the PAD, GLHA designated this request as "Adopted with Modification" as part of the Water Quality Study, while in Table 1-2 of the RSP GLHA designated our study request as "Adopted with Modification" as part of their proposed Riparian and Littoral Habitat Assessment Study. We appreciate this clarification and conceptually agree that most aspects of our requested Exposed Aquatic Habitat Assessment have been captured in the proposed Riparian and Littoral Habitat Assessment Study. However, it is unclear why GLHA is proposing to not adopt the portion of the study request related to evaluation of exposed substrates and habitat in the riverine reaches of the Project areas into this proposed study plan. Whereas this information is already being collected as part of several other surveys (i.e. the Historical Operations Data Assessment Study, Water Quality Study, Instream Flow and Habitat Assessment of the West Branch Downstream of Stone Dam Study, and Wood Turtle Habitat and Presence Study), we believe it should be a relatively simple exercise to have this information incorporated into the Riparian and Littoral Habitat Assessment Study. Having all the assessments in a single document will greatly aid in review of the results.

Finally, it should be noted that the many of documented, modeled, and predicted SGCN aquatic or aquatic-associated invertebrate species in the Project area, as listed in the PAD and below, require specialized experience, specific survey protocols, and proper seasonality to detect. We are <u>not</u> recommending surveys for these species; we mention this because the RSP states that observations of wildlife will be included, and we want to impress that most of these species below will not be documented through general wildlife surveys.

| | | |
|---|---|---|
| 1 | ***Aeshna juncea*** | Sedge Darner |
| 2 | ***Alasmidonta undulata*** | Triangle Floater |
| 3 | ***Alasmidonta varicosa*** | Brook Floater |
| 5 | ***Ameletus browni*** | A Mayfly |
| 6 | ***Anodonta implicata*** | Alewife Floater |
| 7 | ***Baetisca berneri*** | A Mayfly |
| 8 | ***Baetisca lacustris*** | A Mayfly |
| 9 | ***Baetisca rubescens*** | A Mayfly |
| 10 | ***Boloria frigga saga*** | Frigga Fritillary |
| 11 | ***Cicindela ancocisconensis*** | White Mountain Tiger Beetle |
| 12 | ***Cicindela marginipennis*** | Cobblestone Tiger Beetle |
| 13 | ***Enallagma carunculatum*** | Tule Bluet |
| 14 | ***Enallagma laterale*** | New England Bluet |
| 15 | ***Enallagma pictum*** | Scarlet Bluet |
| 16 | ***Epeorus frisoni*** | Roaring Brook Mayfly |
| 17 | ***Lampsilis cariosa*** | Yellow Lampmussel |
| 18 | ***Lanthus vernalis*** | Southern Pygmy Clubtail |
| 19 | ***Leptodea ochracea*** | Tidewater Mucket |
| 20 | ***Leucorrhinia patricia*** | Canada Whiteface |
| 21 | ***Lycaena dorcas claytoni*** | Clayton's Copper |
| 22 | ***Margaritifera margaritifera*** | Eastern Pearlshell |
| 23 | ***Metretopus borealis*** | A Mayfly |
| 24 | ***Ophiogomphus colubrinus*** | Boreal Snaketail |
| 25 | ***Ophiogomphus howei*** | Pygmy Snaketail |
| 26 | ***Papilio brevicauda gaspeensis*** | Short-tailed Swallowtail |
| 27 | ***Parameletus midas*** | A Mayfly |
| 28 | ***Procloeon ozburni*** | A Mayfly |
| 29 | ***Rhithrogena undulata*** | A Mayfly |
| 30 | ***Siphlonisca aerodromia*** | Tomah Mayfly |
| 31 | ***Siphlonurus barbaroides*** | A Mayfly |
| 32 | ***Siphlonurus barbarus*** | A Mayfly |
| 33 | ***Siphlonurus demaryi*** | A Mayfly |
| 34 | ***Siphlonurus securifer*** | A Mayfly |
| 35 | ***Somatochlora brevicincta*** | Quebec Emerald |
| 36 | ***Stagnicola mighelsi*** | Bigmouth Pondsnail |
| 37 | ***Vertigo paradoxa*** | Mystery Vertigo |

We appreciate the Licensee's ongoing commitment to work through these issues. Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,



John Perry
Environmental Review Coordinator

Cc: Francis Brautigam, Joe Overlock—MDIFW Fisheries Division, Augusta Headquarters
Tim Obrey, Jeff Bagley—MDIFW Fisheries Division, Region E
Kevin Dunham, Kevin Gallant—MDIFW Fisheries Division, Region F
Nathan Webb, Ryan Robicheau—MDIFW Wildlife Division, Augusta Headquarters
Craig McLaughlin, MDIFW Wildlife Research and Assessment Section Supervisor
Danielle D'Auria, Shevenell Webb, Derek Yorks, Beth Swartz, Phillip deMaynadier—MDIFW Wildlife Research and Assessment Section
Doug Kane, Scott McLellan—MDIFW Wildlife Division, Region E
Mark Caron, MDIFW Wildlife Division, Region F
Casey Clark, MDMR
Kyle Olcott, MDEP
Jim Vogel, BPL
Julianne Rosset, USFWS
Jeff Murphy, NMFS

April 7, 2022

Ms. Kimberly D. Bose
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Via online submission to: http://www/ferc.gov (cross-filed)**

Subject: **Comments of Maine Council of Trout Unlimited on the Revised Study Plan for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458)**

Dear Secretary Bose:

On behalf of its six chapters and over 2,000 members, Maine Council of Trout Unlimited (TU) submits these comments on the Revised Study Plan (RSP) for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) filed for Great Lakes Hydro America, LLC by Brookfield Renewable ("Brookfield" or "Applicant") dated March 23, 2022. Given the content of the RSP, the comments on the Proposed Study Plan for the project that we submitted with the Appalachian Mountain Club ("AMC"), American Whitewater ("AW"), Caribou, Chesuncook Lake Camp Owners Association, Chesuncook Dam Camp Owners Association, the Allagash Gateway Campground, and Andre Emerson Cushing Corporation[1] ("NGOs") remain germane to this filing as well.

**General Comments**

The Applicant began the PAD stating that the full suite of studies is not needed.[2] It went on to review the 35 study requests submitted by organizations and only proposed conducting 3 without modification, accepted 13 more with modification or included them with other studies, and rejected 19 outright.[3] TU acknowledges that studies should not be repeated that continue to meet project information requirements, but that should be assumed to be generally not the case with studies that are 30 to 40 years old. While TU appreciates that the Applicant has included additional studies in the RSP increasing the number of proposed studies to 40[4] and increased the number of studies it proposes to perform to 16, the proposed studies still do not adequately address significant requests for information that remain unfulfilled or that weaken or dilute the studies so that they will not inform the

[1] TU filing of February 10, 2022, Accession number 20220210-5189.
[2] Brookfield Notices of Intent and Pre-application Documents for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) dated June 11, 2021, page 1-11. "*GLHA maintains that a full suite of new studies is not needed, that the vast body of information on which today's certifications and licenses are soundly based and should be relied upon for these relicensings. In addition, consistent with the Commission's criteria for study requests, the scope and extent of any new study be focused on addressing specific data gaps necessary to inform the development of license requirements.*"
[3] PSP, page 1-19, Table 1-1 title: "*Stakeholder Study Requests for the Ripogenus and Penobscot Mills Project and GLHA's Determination.*"
[4] RSP, Stakeholders Study Requests, Table 1-2, pages 1-26 to 1-28. The actual number of study requests is higher – TU's Fish Assemblage Study Requests were for 10 separate studies to examine all the reaches described in the PAD.

project. This renders the RSP inadequate and threatens to impede and delay the relicensing efforts for both projects by failing to inform both the NEPA analysis and the requirements for Maine 401 water quality certification.

**Specific Comments**

Operational Data

The operational data provided with the RSP[5] does not fulfill project information needs. The data provided includes minimum, average and maximum impoundment water levels, minimum, average and maximum flows through the turbines, and minimum, average and maximum "waste" flows[6] on a daily basis. These data are inadequate to determine the relationship between impoundment levels and water released, compliance with license terms and conditions, or other analyses required to establish flow requirements for future operations. Reporting at least hourly data will inform decisions regarding impoundment levels that have been amply shown to be problematic. Daily reports are inadequate when the flow requirements change during the course of the day. A prime example of this are the minimum flows to support whitewater activities that occur from May 1 to October 1 between the hours of 8:30 a.m. and 5:00 p.m.[7] It should also be noted that the minimum time of restoration from generator trip events is a little over an hour so reporting the data this way greatly minimizes the apparent magnitude of these events and may obscure compliance issues. Since there is no USGS flow gage installed between Pittston Farm on the North Branch of the Penobscot and the gage downstream on the main Stem of the Penobscot at West Enfield, operational data is the only available source of this data.

TU strongly supports the comments of the National Marine Fisheries Service (NMFS) reiterating their request for hourly data that it had requested from Brookfield months ago.[8] Their filing also requests 60 days additional time to file comments on the RSP in order to review the data when it is provided. TU strongly supports this request as well, and believes in the long term, it will improve the relicensing to stay on schedule, not delay it. Brookfield controls its projects from its operations center located in Marlborough MA. In both instances where TU reported low flow excursions to FERC Compliance[9] and Brookfield responded with information, it was readily apparent that Brookfield has operational data available on at least a second-by-second basis. We have attached these reports[10] as Attachments A and B to illustrate the granularity of data that Brookfield has available. Given the apparent availability of

[5] RSP, Appendix X, Daily Operations Data.

[6] Please note the use of the term "Waste Flows." These flows serve to water Ripogenus Gorge to provide additional fishing opportunities, a designated project use under Maine environmental statutes. 100 cfs is a project requirement from July 1 to September 30 each year.

[7] RSP, Figure 1.9, Operational Requirements for the Ripogenus and Penobscot Mills Projects, page 1-13.

[8] NMFS letter RE: Comments on the Revised Study Plan for the Ripogenus (FERC No. 2572) and Penobscot Mills (FERC No. 2458) Hydroelectric Projects dated March 31, 2022.

[9] TU letter Subject: Maine Council of Trout Unlimited Report of Observed Low Flow Events for the Ripogenus Project (P-2572) dated September 21, 2022; TU letter Maine Council of Trout Unlimited Amplifying Report for Observed Low Flow Events for the Ripogenus Project (P-2572) dated January 5, 2022.

[10] Brookfield letter Subject: Ripogenus Project, FERC No. 2572; Trout Unlimited Minimum Flow Complaint dated October 14, 2021; Brookfield Letter Subject: Ripogenus Project, FERC No. 2572; Trout Unlimited Minimum Flow Complaint dated March 10, 2022.

this higher resolution flow data, providing it would be at a minimal cost, and it will better inform an analysis of project effects on intra-day reservoir and downstream flow fluctuations.

NMFS Flow Studies

In addition, these data will inform the vital three flow-related studies requested by NMFS: Study to Evaluate Project Effects on River Temperature in West Branch and Mainstem Penobscot River, Study to Evaluate the Effects of Operating the Penobscot Mills and Ripogenus Dams on the Hydrology of the West Branch and Mainstem Penobscot River Using an Indicators of Hydrologic Alteration Model, and Study to Evaluate Future Flow and Water Temperature Scenarios. These studies and the analysis they include are necessary to assess current project effects and inform potential future project operation. Studies of this type were not done in the past: past studies were oriented on flow in Ripogenus Gorge or were concerned with operating minimum flows, as opposed to time studies centered on the effects of flow and flow fluctuations on aquatic habitat downstream of McKay Station. The effects of flow on the performance of the Holbrook side channel spawning and nursery area have not been studied.

The applicant's proposed Historical Operations Data Assessment Study centers on demonstrating compliance with current license terms and conditions and will not provide the data or analysis required to assess the effects of flows on the aquatic environment. Brookfield takes issue with analyses that use data predicated on climate change as does the NMFS proposed Study to Evaluate Future Flow and Water Temperature Scenarios .[11] Failure of current license terms and conditions to maintain impoundment levels above Ripogenus Dam is ample reason to conduct a study that would provide data that could improve the management of impoundment levels. Rather than base decisions on climate projections, the analysis could be conducted using actual reporting of data over a more recent time period that would be in conformance with FERC guidelines and serve to inform lake level management decisions. If these studies are not included, more information will be needed for the Commission to conduct a NEPA analysis and Maine DEP to award a water quality certification.

Socio-economic Conditions

Another overarching concern with the progress of the relicensings to date involves the Socio-economic Study Request submitted by the Penobscot Indian Nation (PIN).[12] Given that both the paper mills that were operating when the last licenses were issued to the projects have since closed, it is readily apparent that the socio-economic conditions have changed drastically since the last license terms and conditions were formulated. This fact should drive re-evaluation of all aspects of the project. FERC's study plan determination must either acknowledge the change and its wide-ranging effects on many aspects of the projects or include the Socio-economic Study in its determination. The comments of economist Dr. Sharon Kline[13] supporting the study remain germane. Socio-economic analysis will need to be included in FERC's NEPA analysis. The Commission would be well served to include that study to inform its analysis.

[11] RSP, page 6-12.
[12] PIN Comments on the Pre-Application Document (PAD) dated October 12th, 2021.
[13] Dr. Sharon Klein Letter dated February 18, 2022, RE: Penobscot Mills (P-2458-247) and Ripogenus (P- 2572-133) Proposed Study Plan.

TU Study Requests

TU submitted study requests for two types of studies: a Ripogenus Flow Excursion Study[14] and a series of Fish Assemblage Studies[15] correlating to the reaches described in the Pre-Application Document. In its Proposed Study Plan (PSP), Brookfield stated the Historical Operations Data and Assessment Study would document any such deviations from project minimums;[16] however, the proposed study did not account for the stranding study component of our requested Flow Excursion Study. Accordingly, TU proposed a Stranding Evaluation Study in its PSP Comments[17] that we have included as Attachment C for FERC staff's convenience.

TU made two reports to FERC Compliance Division concerning low flow events that result in observed fish strandings below the project[18] that are included as Attachments D and E. FERC responded with a letter that contained a determination that the low flow events did not constitute a violation, but encouraging Brookfield to: *"…work with Trout Unlimited, the resource agencies, and Commission staff to develop a proposal to address strandings and include it in the final license application you file by September 30, 2024."*[19] TU was unaware of any action to date regarding study of stranding events below Ripogenus Dam, and queried Brookfield staff about this in an email sent March 28, 2022 included as Attachment F. Attachment G is the Brookfield response to that email. The email refers TU to another study, the Ramping Study proposed by Ed Spear, that Brookfield also declined to include in the RSP. Brookfield's RSP would provide no information to assess the known project effect of fish stranding or inform potential license conditions that may be implemented to prevent these events. Adoption of the Stranding Evaluation Study would work directly to inform a proposal to address strandings that can be included in the final license application as stated in the FERC issuance cited.

The request for the stranding study was supported by Maine Department of Environmental Protection (MDEP): "*Further, the highly variable flows downstream of the Project dam can affect habitat, including the potential for fish and other aquatic life to become stranded in ledge pools as water levels rise and fall as a result of flow variations. Of particular concern to Trout Unlimited are the station trip flows (400 cfs) and whether such flows adequately maintain 75% of the wetted area downstream of the Project, and whether sudden reduction in flows to 400 cfs cause fish to become stranded. The Department supports TU's study request as it relates to Project operational flows on the riverine habitats affected by*

[14] TU Comments on NOI and PAD, Attachment C.
[15] Id., Attachments C through M.
[16] PSP, Part 1, page 3-14.
[17] TU PSP Comments dated February 21, 2022, page 2.
[18] TU letter Subject: Maine Council of Trout Unlimited Report of Observed Low Flow Events for the Ripogenus Project (P-2572) dated September 21, 2021; Maine Council of Trout Unlimited Amplifying Report for Observed Low Flow Events for the Ripogenus Project (P-2572) dated January 5, 2022.
[19] FERC letter, Subject: Allegation of Minimum Flow Deviations, Project No. 2572-134—Maine, Ripogenus Hydroelectric Project dated March 1, 2022, page 3.

*the Project."* [20] The U. S. Fish and Wildlife Service (USFWS) supported the study request as well.[21] Despite these facts, Brookfield chose not to include this study in the RSP.

At least four low flow events occurred in the late August, early September timeframe of 2021 that were photographically documented by TU[22] and included at least one stranding of a landlocked salmon and multiple macroinvertebrate strandings. Undocumented, anecdotal reports of TU members and registered Maine guides indicate that strandings occur with some frequency during the summer months and their occurrence during winter months is largely unobserved. How frequently these events are occurring is a factor to be considered, but the severity of the strandings should be considered as well and a stranding study would inform that concern, especially with regard to its effects on the Holbrook spawning and nursery area.

The 100 cfs flow directed over the sluiceway at Ripogenus Dam from July 1 to 30 September serves to alleviate stranding problems during generator trip conditions. The project could be operated using additional water from its deep gate capability as has been done in the past[23] and this could eliminate any possible stranding issues by ensuring higher constant flows. It would also provide additional aquatic habitat and fishing opportunities within the Ripogenus Gorge that is generally dewatered except for the July 1 through September 30 sluiceway flows. The capability to eliminate strandings and provide flows below Ripogenus Dam that are more 'fish friendly' clearly exists, and more information is need to improve conditions that can be provided through a combination of analysis of hourly operational data, the flow studies requested by NMFS, the Ramping Study proposed by Ed Spear, and the Stranding Evaluation Study proposed by TU. Without these, NEPA analysis of the project's effects on stranding and the development of appropriate license conditions will prove difficult.

The other TU study requests were for a series of Fish Assemblage Studies to cover all the reaches described in the PAD. The RSP does not include these studies that MDEP supported as well: "*In order to evaluate whether the impounded waters support all species of fish indigenous to those waters, the Applicant must conduct a fish assemblage study in order to draw a comparison to the fish assemblage indigenous to those waters. Typically, such studies are proposed by Maine's Department of Inland Fisheries and Wildlife; although DIFW didn't request such a study Trout Unlimited's fish assemblage study request was declined and so the Department supports TU's request here and has attached its supporting study request."*[24] It should be noted that MDEP policy for sampling is to require it for every reach affected by project operations. Given the fragmented nature of the habitat caused by the complexity of the Penobscot Mills Project dams and impoundments, ten reaches were identified and studied. The reaches each need to be informed by current fish assemblage data. Brookfield documents that in one of the reaches, an introduced species was discovered soon after a fish assemblage study

[20] MDEP Comments on the Proposed Study Plans for the Ripogenus (FERC No. 2572) and Penobscot Mills (FERC No. 2458) Hydroelectric Projects dated February 21, 2022, page 3.
[21] USFWS letter RE: Proposed Study Plan Comments for the Ripogenus (FERC No. 2572-133) and Penobscot Mills (FERC No. 2458-247) Hydroelectric Projects dated February 18, 2022.
[22] TU letter Subject: Maine Council of Trout Unlimited Report of Observed Low Flow Events for the Ripogenus Project (P-2572) dated September 21, 2021; Maine Council of Trout Unlimited Amplifying Report for Observed Low Flow Events for the Ripogenus Project (P-2572) dated January 5, 2022.
[23] Brookfield Letter dated August 24, 2015, page 2.
[24] MDEP Comments on the Proposed Study Plans for the Ripogenus (FERC No. 2572) and Penobscot Mills (FERC No. 2458) Hydroelectric Projects dated February 21, 2022, page 2.

had been conducted there.[25] "*There are recent reports that smallmouth bass have become illegally introduced to the impoundment (Kevin Dunham, MDIFW, personal communication, May 2021).*" This statement refers to Table 5.4-7, Fish Assemblage Data from North Twin Impoundment (2016-2017) which does not list smallmouth bass. This underlines the need for current information.

Brookfield provided rationale for not adopting fish assemblage studies, "… *studies need not be duplicated unless there are identified data gaps, or changes in operation that may impact the fisheries resources.*"[26] TU agrees that studies do not need to be duplicated. The problem is that Brookfield has yet to produce a coherent compilation of the assemblage studies conducted for the 10 reaches the projects contain: the PAD contained a patchwork of excerpts from studies, many from the last relicensing. When TU asked for additional studies, it provided some in the form of data tables, others by reference to web location. No coherent compilation of the studies that Brookfield wants the Commission to accept as meeting 18 CFR § 5.6 has yet been produced. MDIFW notes that data gaps may exist – where they are is impossible to determine given the information that Brookfield has supplied to date. TU requests that a compilation of fisheries assemblage studies be accomplished and an assessment of data gaps be required. Appropriate fish assemblage studies would then be conducted to fill any of the gaps identified.

Brookfield goes on to state: "*Study request constitutes basic research and/or is not likely to inform the development of license conditions (Study Criteria No. 5).*" If this were so, then the FERC Pad Adequacy Review Checklist Pursuant to 18 CFR § 5.6 would not make "*Fish and aquatic resources: description and impacts*" a checklist item. The statement that follows: "*Study request does not propose a specific methodology, proposes a methodology that is untried or uncertain, or proposes a methodology that will not meet the stated objective or yield the intended results (Study Criteria No. 6)*" is ridiculous. The PAD cites numerous such studies, the methodology is well established, Brookfield itself has requested them in the past to replace more expensive radiotracking studies. These rationales are without merit. Only by analysis of the project and how it is operated in light of current fisheries data can FERC make informed decisions concerning future operations.

Again, USFWS Comments supported the TU Study Plan Requests.[27] For all the above reasons, we ask that FERC include the Stranding Evaluation Study, and the Fish Assemblage Studies needed to fill any data gaps. FERC included Fish Assemblage Studies in an information request for the Mongaup Projects described on the next page to good effect. The Mongaup River Projects involved very similar issues over fish assemblage, existing information, and the lack of data compilation.

Other Study Requests

The Ramping Study and the Creel Study requested by Ed Spear would provide additional data beyond TU's Stranding Evaluation Study and Fish Assemblage Studies.

[25] PAD, page 5-120.
[26] RSP, page 6-15
[27] USFWS letter RE: Proposed Study Plan Comments for the Ripogenus (FERC No. 2572-133) and Penobscot Mills (FERC No. 2458-247) Hydroelectric Projects dated February 18, 2022.

TU continues to strongly support the studies proposed by MDMR as essential to the ongoing restoration of the Penobscot River Watershed: Upstream Fish Passage Alternatives Study, and Downstream Fish Passage Alternatives Study.

TU supports the USFWS Study: Upstream American Eel Passage Assessment Study – Presence, Distribution, and Relative Abundance. In the RSP, the Applicant proposes *"…to utilize the eDNA methodology suggested by MDMR to evaluate the current distribution of American eels upstream of the Projects (Appendix D of this RSP).*" Brookfield states, "*This initial step will inform the relative abundance of eels upstream of the Project developments*." The presence of American eels in the watershed is well established. This is another example of Brookfield taking a study proposal that would inform the project and replacing it with one that will not.

TU supports the comments of American Whitewater and the Appalachian Mountain Club regarding the Recreation Study and the Whitewater Boating Assessment Study. There are multiple informal recreation sites that are used for fishing in the area from Ripogenus Dam to Nesowadnehunk Falls and these should be included in the study as they are directly impacted by project operations. We also agree with the need for "*an online survey, input from a stakeholder working group, and key person interviews with organizational representatives from user groups, representatives of camp owners and other recreation related interests, such as outfitters.*" The flow studies that Brookfield felt are unnecessary are key to the Whitewater Boating Assessment Study Plan and "Whitaker-type" methodology. These studies should take place in coordination with other studies Brookfield is not proposing to include: the Ramping Study, Stranding Evaluation Study and the flow studies requested by NMFS. Lack of these features in the Whitewater Boating Assessment Study is an example of Brookfield seriously weakening the ability of the study to inform the process by eliminating key components.

The current license places no restrictions on impoundment water levels that project operations have caused to remain historically low for the past two years. TU supports the diverse studies required to assess the impacts of water levels on a variety of species: Common Loon Productivity Assessment, Study to Determine Status of Impoundment Zooplankton Population and its Relationship to Larval and Juvenile Rainbow Smelt, Freshwater Mussel Survey, Terrestrial Wildlife and Botanical Resources Study, and Northern Long-eared Bat Acoustic Study.

**Recent lessons learned from another hydro relicensing**

Rather than consider the projects such as Centralia that Brookfield referenced in its PSP and that the NGOs demonstrated were not appropriate for comparison with either the Ripogenus or Penobscot Mills Projects,[28] we ask that the Commission consider some that are, these recent relicensings undertaken by Eagle Creek, LLC in New York State: Rio Project (P-9690-112), Mongaup Falls Project (P-10481-067) Swinging Bridge Project (P10482-117) - collectively, the Mongaup River Hydroelectric Projects. Like the Ripogenus and Penobscot Mills projects, these projects were relicensed at the same time. Here Eagle Creek proposed no studies and used language strikingly similar to that used by

[28] TU filing of February 10, 2022, Accession number 20220210-5189, pages 4 and 5.

Brookfield in the PAD: "*Based on the robust nature of the study performed in support of issuing the Project's existing licenses, as well as the protection, mitigation, and enhancement (PM&E) measures associated with the Project's existing licenses, Eagle Creek believes that there is a sufficient amount of existing data for the majority of the resource areas to support the relicensing process. In particular, given that the Project's existing licenses were issued following the 1986 Electric Consumers Protection Act amendment to the Federal Power Act, the Projects underwent a comprehensive environmental analysis to establish Project-specific PM&E measures and in support of the Commission's National Environmental Protection Act analysis. This analysis was later supplemented through a number of post-license issuance study and monitoring activities associated with water quality, fish entrainment, and aquatic habitat. In addition, in support of the Rio Project's minimum flow powerhouse, additional evaluations were performed and PM&E measures were established.*"[29]

Here FERC staff recognized the deficiencies associated with the use of prior study data and its potential effect on NEPA analysis and provided for eleven studies;[30] we have included this as Attachment H. Eagle Creek ultimately included fourteen in its Revised Study Plan;[31] these included both fish assemblage and flow studies. The scope of the Mongaup River is much smaller and simpler with generating capacity of the West Branch projects only a fraction of the Ripogenus and Penobscot Mills projects. These projects are located about ten miles from Port Jervis, New York in an area that is much more developed than the West Branch and ecological concerns are reduced. Decisive action by FERC staff could similarly resolve the issues involved with study plans currently proposed for the larger and more complex Ripogenus and Penobscot Mills projects located in one of Maine's primary wilderness areas.

**Conclusions for Ripogenus – Penobscot Mills Revised Study Report**

Brookfield did not propose any specific studies in the PAD, wishing to rely on data from previous studies, an approach supportive of maintenance of the status quo. Brookfield has yet to acknowledge that major socio-economic changes have occurred since the last relicensing that have major implications for project operations both present and future: the extremely lax terms granted under the last license to Great Northern Paper are not compatible with the current conditions and have resulted in dewatering and other obvious adverse project effects. A number of the studies adopted are designed to avoid collection of data that can be used to critically assess project effects and inform potential license conditions; other study and information requests continue to be excluded outright Including critical flow studies requested by NMFS.

It should also be noted that LD 1964 was passed by the Maine Legislature on March 29, 2022 and will become law in the near future. This legislation improves the water quality classification of the West Branch below Ripogenus Dam from Class B to Class A: "*The habitat must be characterized as natural*." For Class B waters: "*The habitat must be characterized as unimpaired*." This means that waters in the Ripogenus Project will be held to a higher standard. This is another change from conditions that existed

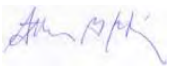
[29] Eagle Creek Pre-application Document for the Mongaup River Hydroelectric Projects dated March, 2017, page 127.
[30] FERC Request for Studies and Additional Information for Project No. 9690-112 2, Project No. 10481-067, and Project No. 10482-117 dated July 27, 2017.
[31] Revised Study Plan for Mongaup Hydroelectric Projects dated January 10, 2018, page 2.

when the projects were relicensed some 30 years ago, and effects of the designated projects uses such as recreation, fishing, and aquatic habitat will be subject to greater scrutiny under Maine law. This is an additional reason for the Commission to act decisively to obtain the information needed to inform the projects.

Adoption of the suite of studies proposed by the stakeholders described in this filing would require the data collection that FERC needs to inform its NEPA analysis, fully evaluate project effects and licensing alternatives, inform potential license conditions, and support the timely implementation of the licensing proceeding.

Maine Council of Trout Unlimited appreciates the opportunity to comment on these critically important projects.

Respectfully,



Stephen G. Heinz

Maine TU Council FERC Coordinator

**Attachments:**

A - Brookfield letter Subject: Ripogenus Project, FERC No. 2572; Trout Unlimited Minimum Flow Complaint dated October 14, 2021

B - Brookfield Letter Subject: Ripogenus Project, FERC No. 2572; Trout Unlimited Minimum Flow Complaint dated March 10, 2022

C - Stranding Evaluation Study Request

D - Maine Council of Trout Unlimited Report of Observed Low Flow Events for the Ripogenus Project (P-2572)

E - Maine Council of Trout Unlimited Amplifying Report for Observed Low Flow Events for the Ripogenus Project (P-2572

F- Email from Stephen Heinz, TU to Randal Dorman, Brookfield

G - Email response from Randal Dorman, Brookfield to Stephen Heinz, TU

H - FERC Request for Information dated July 27, 2017 regarding the Monguap Projects

Document Accession #: 20211014-5123 Filed Date: 10/14/2021

# Attachment A

October 14, 2021

**FERC Project 2572**
**Article 402**

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

***Electronically Filed***

**Subject: Ripogenus Project, FERC No. 2572; Trout Unlimited Minimum Flow Complaint**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), licensee for the Ripogenus Project located on the West Branch of the Penobscot River in Maine, submits this letter in reply to Commission correspondence dated October 4, 2021, in which the Commission requests additional information regarding a complaint filed on September 21, 2021 by Mr. Stephen Heinz, writing on behalf of the Maine Council of Trout Unlimited (TU), that alleges two deviations from minimum flow requirements at the Project. The Commission requests that GLHA file a response to these allegations within 15 days (i.e., by October 19th) that includes:

> *(1) a description of your required flows on August 30 and September 16, 2021, based on the date, time and hydrologic year type; (2) gage data and/or project operational data indicating the actual flows prior, during, and after the alleged deviation; and (3) a description of any operational changes for August 30 and September 16, 2021.*

**August 30, 2021 low flow event**

On August 30, 2021, McKay Station (part of the Ripogenus Project) tripped offline at 12:05 pm as a result of thunderstorms in the area. The 400 cfs minimum outage flow was restored to the river within 13 minutes via the station's minimum flow system, and then the normal 2,000 cfs whitewater recreation minimum flow was restored within approximately 3.5 hours. A courtesy notification of this event was distributed to resource agencies on August 31, 2021.

> Required flows – between May 1st and September 15th, Article 402 of the Ripogenus Project license requires that minimum whitewater recreation flows of between 2,000 and 2,300 cfs be released from the Project between 0830 and 1700 hrs. on a daily basis. In a "dry" hydrologic year (such as 2021), the required minimum flows are 2,200 cfs on Saturdays and Sundays, 2,000 cfs on Mondays and Fridays, and 1,800 cfs on Tuesdays through Thursdays.
>
> During other hours of the day outside of the whitewater release time period (i.e., 1700 to 0830 hrs.), Article 402 requires a minimum flow of 1,000 cfs from June 8th through October 14th. Additionally, Article :ed "outage" minimum flows of 400 cfs when generating unit failures occur a "*with scheduled minimum flows to be resumed as quickly and practically as p es from Ripogenus Dam if necessary, but in no event in more than three days following the initial outage*".

Finally, Article 402 states that "*These specified minimum flows shall be the minimum flows for each hourly period (measured on the basis of an hourly average)*".

Since August 30th was a Monday and 2021 is a "dry" hydrologic year, Article 402 required that a minimum whitewater recreation flow of 2,000 cfs be released during the 0830 to 1700 hr. time period when the station trip occurred.

Operational data – the attached charts show Ripogenus Project outflows prior to, during, and after the August 30 low flow event and alleged license deviation.

Operational changes – On the afternoon of August 30, 2021, several hydro stations on the West Branch of the Penobscot River tripped offline during and after thunderstorm activity, including McKay Station at 12:05 pm. An investigation determined that a damaged lightning arrestor caused the outage at McKay Station. The minimum outage flow was restored to the river within 13 minutes via the station's minimum flow system (which automatically provides an emergency outage flow of more than 400 cfs), and then the 2,000 cfs whitewater recreation minimum flow was restored by 3:30 pm. The Ripogenus outflow dropped to a low of 109 cfs during the event, while the lowest hourly average outflow was 640 cfs.

Summary – although GLHA provided a courtesy notification regarding the August 30 low flow event to resource agencies (see attached), GLHA determined that the event was not reportable to the Commission as an excursion from license requirements, since the hourly average outflow did not drop below the emergency outage flow of 400 cfs. Further, the automatic minimum flow system at McKay Station functioned as designed during the event, and GLHA was able to restore river flows in a timely fashion.

**September 16, 2021 low flow event**

On September 16, 2021, McKay Station tripped offline due to a Versant Power (local utility) line disturbance. Flow was restored to the river within 5 minutes via the station's minimum flow system, and then the normal 1,000 cfs minimum flow was restored within approximately 2.5 hours. A courtesy notification regarding this event was distributed to resource agencies on September 16, 2021.

Required flows – from September 16th through October 14th, Article 402 requires a minimum flow of 1,000 cfs, except higher minimum whitewater recreation flows are required on weekends from 0830 – 1700 hrs. through October 1st.

As indicated above for the August 30th event, Article 402 allows reduced minimum "outage" flows of 400 cfs during generating unit failures at McKay Station, and it specifies that an hourly average be used as a basis for license compliance.

Since September 16th was a Thursday, whitewater recreation flows were not required that day, and only the minimum flow was being conveyed at the time of the station trip.

Operational data - the attached chart shows Ripogenus Project outflows prior to, during, and after the September 16th low flow event and alleged license deviation.

Operational changes – at 7:31 am on September 16, 2021, all of GLHA's hydro stations on the Upper Penobscot (McKay; North Twin; Millinocket; Dolby; East Millinocket; Weldon) tripped offline due to a local utility (Versant Power) line disturbance. At McKay Station, the 400 cfs emergency outage flow was restored to the river within 5 minutes via the station's

minimum flow system, and then the 1,000 cfs minimum flow was restored by 9:58 am. The Ripogenus outflow dropped to a low of 118 cfs during this event, while the lowest hourly average outflow was 508 cfs.

Summary – as with the August 30 low flow event, a courtesy notification regarding the September 16th low flow event at Ripogenus was provided to resource agencies (see attached). However, GLHA determined that the event was not reportable to the Commission as an excursion from license requirements, since the hourly average outflow did not drop below the emergency outage flow of 400 cfs. Further, the automatic minimum flow system at McKay Station functioned as designed during the event, and GLHA was able to restore river flows in a timely fashion.

In summary, the two events detailed in TU's complaint were (1) created by unforeseeable events beyond GLHA's control; (2) corrected within 13 and 5 minutes, respectively; (3) resulted in minimum flow reductions too minimal and transitory to be considered license violations; and (4) nonetheless promptly reported as a courtesy to the relevant resource agencies.

The Commission's October 4th letter also requests that GLHA provide (1) any comments received from resource agencies or other interested parties regarding the flows on these dates, and GLHA's response, and (2) the maximum ramping rates that occurred on August 30 and September 16, 2021. GLHA received no comments from the resource agencies in reply to GLHA's courtesy notifications regarding the August 30 and September 16 low flow events, and no comments or questions were received from any other stakeholders (including TU). In addition, the Ripogenus FERC license does not require flow ramping, so minimum flows were re-established as quickly as possible (consistent with the Article 402 requirement to resume scheduled minimum flows *"as quickly and practically as possible")* after each low flow event as shown in the attached graphs.

Please e-mail me at kevin.bernier@brookfieldrenewable.com or call me at (207) 951-5006 if you have any questions or need additional information.

Sincerely,

Kevin Bernier

Kevin Bernier
Senior Compliance Specialist

Cc: N. Stevens, J. Cole, K. Maloney, M. Kessel, S. Michaud, S. Farrington, R. Dill, M. Osborne, T. Mapletoft, R. Dorman, L. Macomber, P. McNelis, P. Wainwright; GLHA
A. Burtner: FERC DHAC – Washington

GLHA File: HSSE 4a/2572/01

| | |
|---|---|
| **From:** | Bernier, Kevin |
| **To:** | Kathy Howatt (Kathy.howatt@maine.gov); Dunham, Kevin (Kevin.Dunham@maine.gov); Gallant, Kevin; Mark Caron (mark.caron@maine.gov); John Perry (john.perry@maine.gov); Sferra, Christopher; Bryan Sojkowski; Julianne Rosset (julianne_rosset@fws.gov); Tim Obrey (tim.obrey@maine.gov); Doug Kane (douglas.kane@maine.gov) |
| **Cc:** | Cole, James; Maloney, Kelly; Dill, Richard; Osborne, Michael; Kessel, Miranda; Michaud, Steve; Stevens, Nate; Mapletoft, Thomas; Farrington, Stephen; Macomber, Lance; Wainwright, Paul; McNelis, Patrick; Dorman, Randy |
| **Subject:** | Penobscot station trips |
| **Date:** | Tuesday, August 31, 2021 3:22:00 PM |
| **Attachments:** | image001.gif |

The North Twin and Millinocket hydro stations (both part of the Penobscot Mills Project) tripped offline during yesterday afternoon's thunderstorms when a breaker tripped. Following a downstream public safety check and activation of a siren alarm, system operators deflated the inflatable flashboard system at Stone Dam, thereby re-establishing the required 2,000 cfs minimum flow at Millinocket. Outflow from the Millinocket Development dropped to a low of about 175 cfs during this approximate 14-minute flow interruption.

Article 403 of the Penobscot Mills Project license requires in part that:

> *"The licensee shall operate the Millinocket, Dolby, and East Millinocket developments in a run-of-river mode while providing an instantaneous minimum flow of 2,000 cubic feet per second (cfs) to the West Branch of the Penobscot River at Millinocket, for the protection of water quality and aquatic habitat in the Penobscot River."*

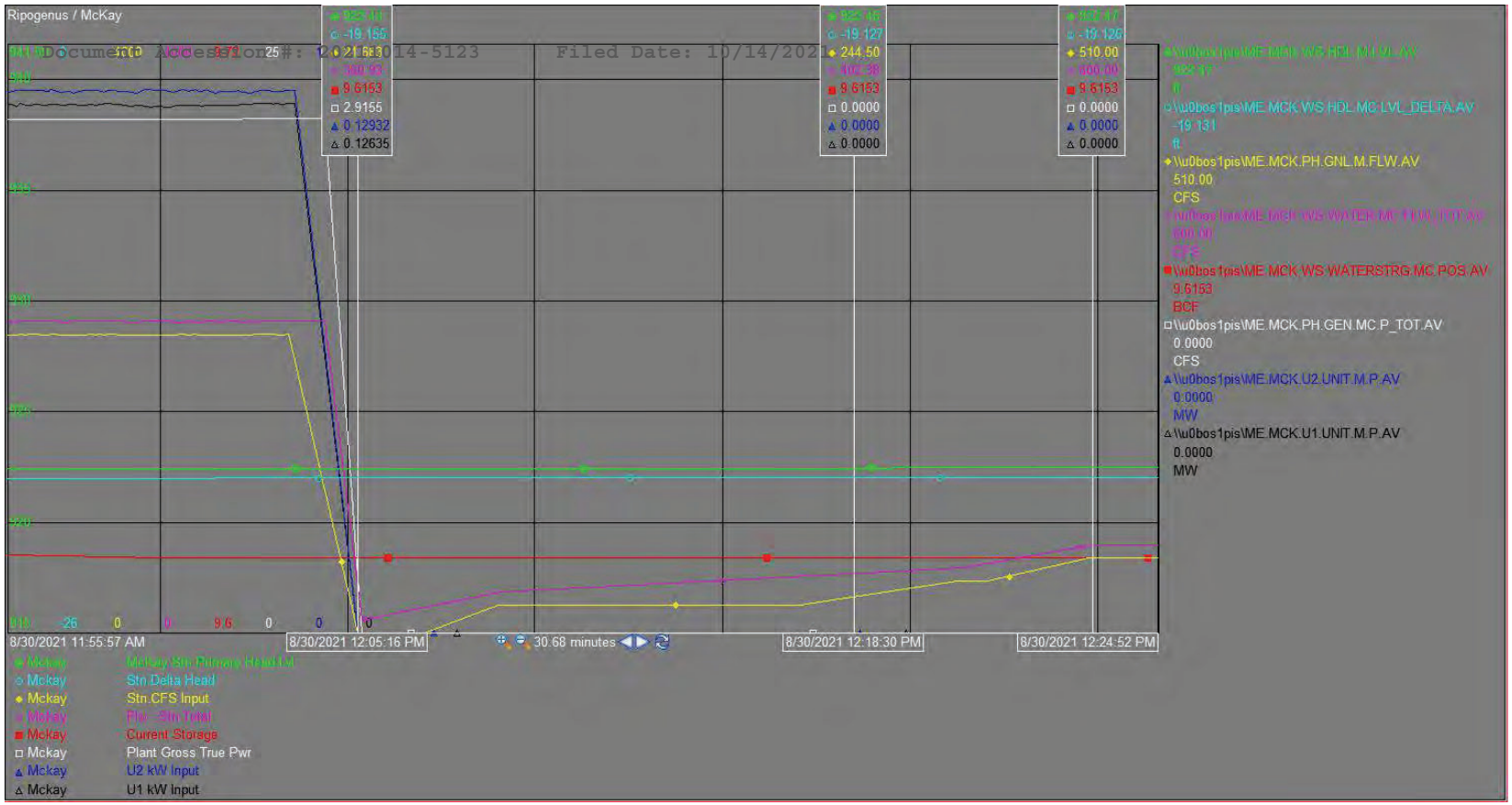
Just so you know, McKay Station (part of the Ripogenus Project) also experienced two brief station trips yesterday afternoon during the thunderstorms; however, flow was restored to the river within 15 minutes after each event via either the station's minimum flow system or by restarting a unit. The McKay Station trips are not reportable, since there was no excursion of the hourly average minimum flow requirement.

Great Lakes Hydro America, LLC is still investigating the definitive causes for these station trips, but at this point they appear to be weather-related. I will copy you on the final report to FERC, but in the meantime, please let me know if you have any questions or concerns.

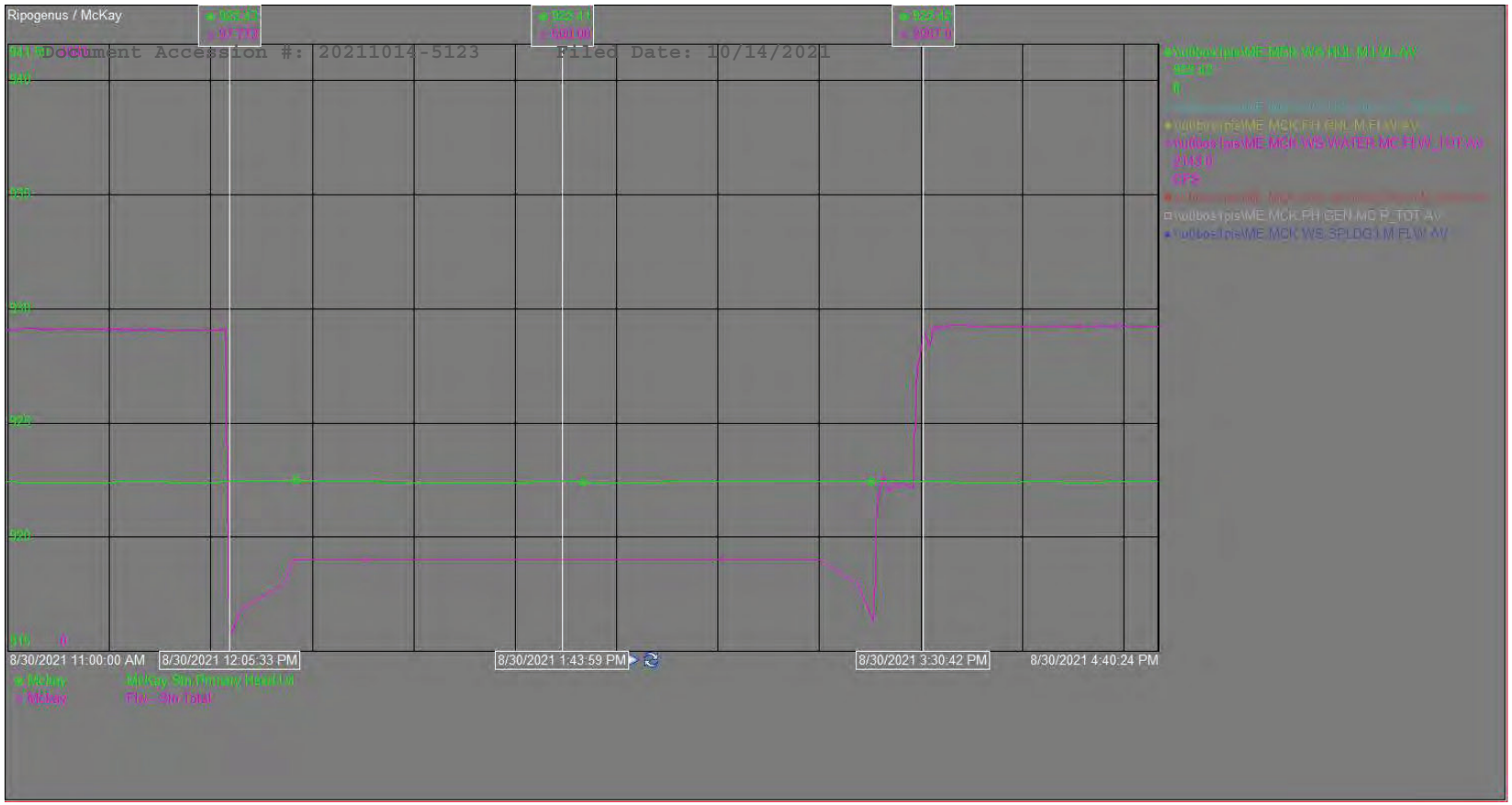
**Kevin Bernier**
Senior Compliance Specialist

**Brookfield Renewable**
1024 Central Street, Millinocket, ME 04462
**C** 207 951 5006
kevin.bernier@brookfieldrenewable.com
www.brookfieldrenewable.com

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Ripogenus / McKay
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8/30/2021 3:30:42 PM
8/30/2021 4:40:24 PM

| | |
|---|---|
| **From:** | Bernier, Kevin |
| **To:** | Kathy Howatt (Kathy.howatt@maine.gov); Dunham, Kevin (Kevin.Dunham@maine.gov); Gallant, Kevin; Mark Caron (mark.caron@maine.gov); John Perry (john.perry@maine.gov); Sferra, Christopher; Bryan Sojkowski; Julianne Rosset (julianne_rosset@fws.gov); Tim Obrey (tim.obrey@maine.gov); Doug Kane (douglas.kane@maine.gov); Casey Clark (casey.clark@maine.gov); Sean M Ledwin - Maine Department of Marine Resources (Sean.M.Ledwin@maine.gov); Mitch Simpson (Mitch.Simpson@maine.gov); Jeff Murphy (Jeff.Murphy@noaa.gov); Donald Dow (Donald.Dow@noaa.gov); Gail Wippelhauser, Ph. D. (gail.wippelhauser@maine.gov) |
| **Cc:** | Cole, James; Maloney, Kelly; Dill, Richard; Osborne, Michael; Kessel, Miranda; Michaud, Steve; Stevens, Nate; Mapletoft, Thomas; Farrington, Stephen; Macomber, Lance; Wainwright, Paul; McNelis, Patrick; Dorman, Randy; Brochu, Robert |
| **Subject:** | Upper Penobscot system wide outage |
| **Date:** | Thursday, September 16, 2021 8:08:00 PM |
| **Attachments:** | image001.gif |

This morning at 07:31 hrs, all of Brookfield's hydro stations on the Upper Penobscot (McKay; North Twin; Millinocket; Dolby; East Millinocket; Medway; Weldon) tripped offline due to a Versant Power line disturbance. Brookfield crews have been busy all day getting the stations back online and restoring river flows as soon as practicable after making public safety checks downstream. These station trips caused disruptions in run-of-river flows at the Medway Project (FERC No. 2666) and at the Millinocket, Dolby, and East Millinocket Developments (Penobscot Mills Project, FERC No. 2458). The trip of the Millinocket Hydro Station also resulted in an estimated 15-minute deviation from that Development's 2,000 minimum flow requirement, while the trip of Weldon Station resulted in an approximate 42 minute deviation from the Mattaceunk Project's 1,674 cfs minimum flow condition. As of 13:50 hrs this afternoon, all of the stations are back online, and normal operations have resumed.

Article 403 of the Penobscot Mills license states in part that:

> "*The licensee shall operate the Millinocket, Dolby, and East Millinocket developments in a run-of-river mode while providing an instantaneous minimum flow of 2,000 cubic feet per second (cfs) to the West Branch of the Penobscot River at Millinocket, for the protection of water quality and aquatic habitat in the Penobscot River. The licensee shall at all times act to minimize the fluctuation of the reservoir surface elevations by maintaining a discharge from each of these developments so that, at any point in time, flows, as measured immediately downstream from the tailraces of the developments, approximate the sum of the inflows to the project reservoir. Run-of-river operation or minimum flows may be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods upon mutual agreement between the licensee, the U.S. Fish and Wildlife Service, and the Maine DEP. If the run-of-river operation or minimum flow is so modified, the licensee shall notify the Commission as soon as possible, but no later than 10 days after each such incident*."

Article 402 of the Medway Project license (as amended on April 18, 2005) states:

> "*The licensee shall operate the project in a run-of-river mode to protect aquatic life and water quality in the West Branch Penobscot River. The licensee shall at all times act to minimize reservoir surface elevation fluctuation by maintaining project discharge so that, at any point in time, flows immediately downstream from the project dam approximate flows into the project reservoir. The licensee shall maintain an impoundment surface elevation*

*within six inches of 260.3 feet above mean sea level (msl) except during emergency, maintenance, and high or low flow events beyond the licensee's control, following flashboard failures. Following flashboard failures, the licensee shall maintain the impoundment level within six inches of the spillway crest and shall replace the flashboards as soon as safely possible.*

*Run-of-river operations may also be modified for short periods upon mutual agreement between the licensee and the Maine Department of Environmental Protection (DEP). The licensee shall notify the Commission as soon as possible, but no later than 10 days after each incident resulting in a change in run-of-river conditions as specified above*."

Article 403 of the Mattaceunk Project license in part states:

"*In addition to implementing the impoundment level requirements of Maine Department of Environmental Protection's (Maine DEP) condition A (Appendix A) and minimum flow requirements of Maine DEP's condition B (Appendix A), the licensee must operate the Mattaceunk Project in a run-of-river mode with year round use of the 4-foot-high flashboards such that average daily outflow approximates average daily inflow*."

"*For unplanned deviations lasting 3 hours or less that do not result in visible environmental effects, the licensee must file an annual report, by March 1, describing each incident that occurred during the prior January 1 through December 31 time period*."

Condition B of the Maine DEP Water Quality Certification for the Mattaceunk Project states in part:

*"Except as temporarily modified by: 1) approved maintenance activities, 2) extreme hydrologic conditions 3) emergency electrical system conditions, or 4) agreement between the Applicant, the Department, and state and/or federal agencies as appropriate, a total minimum flow of 1,674 cfs or inflow, whichever is less, and a daily average minimum flow of 2,393 cfs from July 1 through September 30 or 2,000 cfs from October 1 through June 30, shall be released from the Project to protect downstream fish and aquatic resources, unless inflow is less than the stated daily average minimum flows, in which case outflow from the Project would equal the inflow to the Project*."

As indicated above, McKay Station (part of the Ripogenus Project) also tripped offline during this event; however, the 400 cfs emergency outage flow was restored to the river within 5 minutes via the station's minimum flow system, and then the normal 1,000 cfs minimum flow was restored by 09:58 hrs. Thus, the McKay Station trip is not reportable to FERC, since there was no excursion of the Project's hourly average minimum flow requirements.

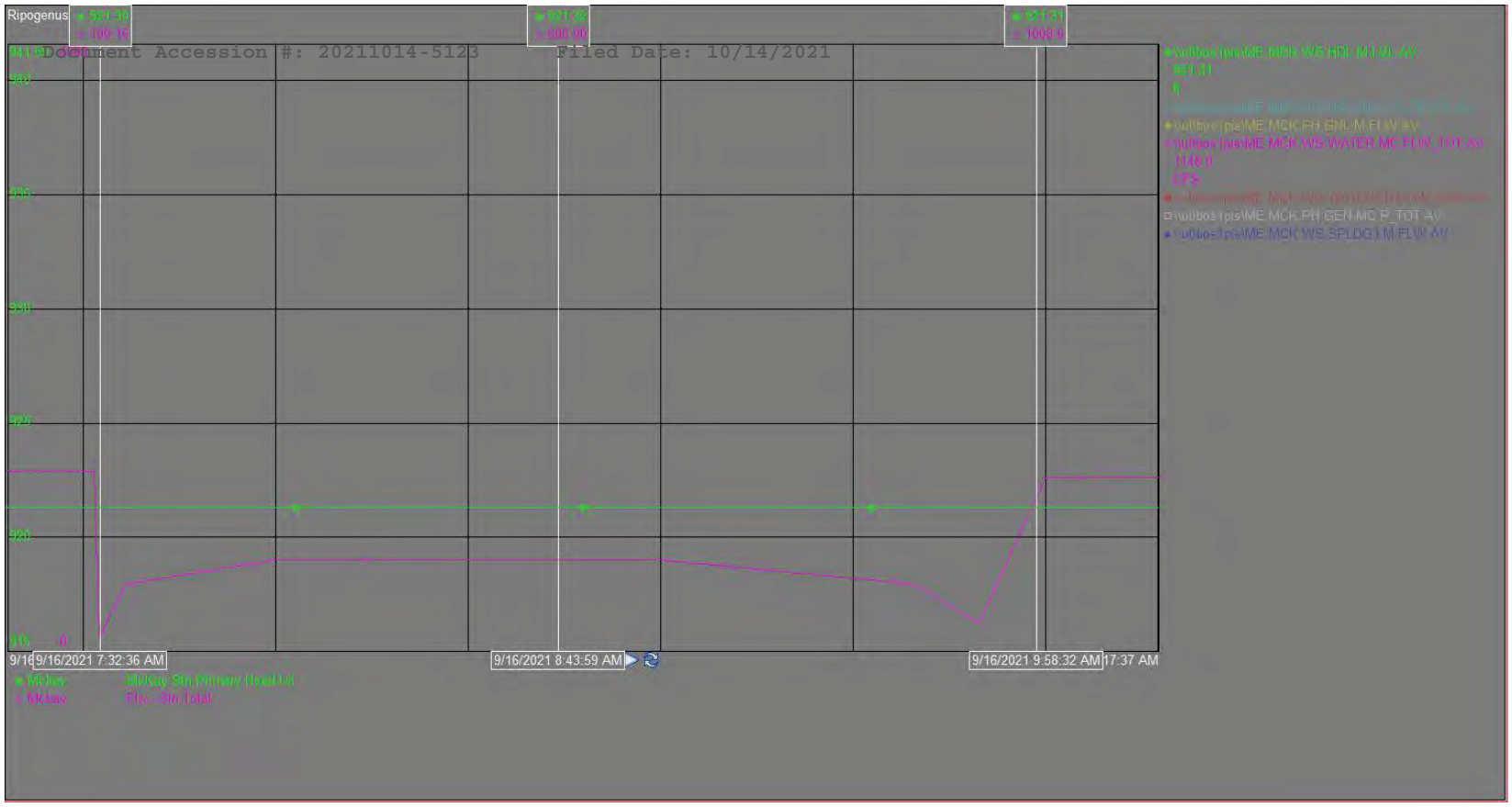
GLHA is still investigating and collecting information on this event, which will be detailed in a report to FERC within 10 days. I will copy you on this report, but in the meantime please let me know if you have any comments or questions.

**Kevin Bernier**
Senior Compliance Specialist

**Brookfield Renewable**
1024 Central Street, Millinocket, ME 04462
**C** 207 951 5006
kevin.bernier@brookfieldrenewable.com
www.brookfieldrenewable.com



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Ripogenus
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9/16/2021 9:58:32 AM

# Attachment B

March 10, 2022

**FERC Project 2572**
**Article 402**

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

***Electronically Filed***

**Subject: Ripogenus Project, FERC No. 2572; Trout Unlimited Minimum Flow Complaint**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), licensee for the Ripogenus Project (Project) located on the West Branch of the Penobscot River in Maine, submits this letter in reply to Commission correspondence dated March 8, 2022, in which the Commission requests additional information regarding a complaint filed on January 5, 2022 by Mr. Stephen Heinz, writing on behalf of the Maine Council of Trout Unlimited (TU). Mr. Heinz alleged that Project operations on Tuesday, September 7, 2021 represented a deviation from minimum flow requirements at the Project.

On March 8, 2022 the Commission requested that GLHA file a response to this allegation within 15 days (i.e., by March 23rd) that at a minimum includes:

> *(1) gage data and/or project operational data indicating the flows prior, during, and after the alleged deviation; and (2) a description of any operational changes made on September 7, 2021. If upon compiling the requested information, you verify that one or more deviations occurred, please indicate why the deviation was not reported to the Commission and describe how you will prevent similar oversight in the future. Please also include any comments you may have received from resource agencies or other interested parties regarding the flows on these dates, and your response.*

**Minimum flow requirements**

Between May 1st and September 15th, Article 402 of the Ripogenus Project license requires that minimum whitewater recreation flows of between 2,000 and 2,300 cfs be released from the Project between 0830 and 1700 hrs. on a daily basis. In a “dry” hydrologic year (such as 2021), the required minimum flows are 2,200 cfs on Saturdays and Sundays, 2,000 cfs on Mondays and Fridays, and 1,800 cfs on Tuesdays through Thursdays.

During other hours of the day outside of the whitewater release time period (i.e., 1700 to 0830 hrs), Article 402 requires a minimum flow of 1,000 cfs from June 8th through October 14th. Finally, Article 402 states that “*These specified minimum flows shall be the minimum flows for each hourly period (measured on the basis of an hourly average).*”

**September 7, 2021 operations**

Operational changes – Shortly after the whitewater recreational flow period ended on September 7th (at 17:00 hrs.), flow from McKay Station was reduced from about 1,900 cfs to approximately 1,050 cfs (for a total Project flow of about 1,150 cfs) to conserve water during the severe drought conditions in the upper Penobscot drainage. No other operational changes were made at the time of the alleged minimum flow excursion.

Project operational data – The attached table provides operational flow data for September 7, 2021 from 17:00 hrs to midnight. No excursions from the 1,000 cfs minimum flow requirement are shown.

In summary, the September 7, 2021 event detailed in Mr. Heinz's complaint was not a minimum flow excursion and was not reportable to the Commission or the resource agencies.

Although this event did not result from a unit or station trip, the Commission has recently directed GLHA to develop a proposal to address potential fish strandings that may result from unit/station trips at the Project. (See the Commission's March 1, 2022 letter to GLHA.) GLHA will include this information in the Project's Final License Application, which will be filed with the Commission on or before September 30, 2024.

Please e-mail me at kevin.bernier@brookfieldrenewable.com or call me at (207) 951-5006 if you have any questions or need additional information.

Sincerely,

Kevin Bernier

Kevin Bernier
Senior Compliance Specialist

Cc: N. Stevens, J. Cole, K. Maloney, J. Pelletier, S. Michaud, S. Farrington, R. Dill, M. Osborne, T. Mapletoft, R. Dorman, L. Macomber, P. McNelis, P. Wainwright; GLHA
A. Burtner: FERC DHAC – Washington

GLHA File: HSSE 4a/2572/01

# McKay / Ripogenus Operations

*September 7, 2021*

| Date & Time | Station Flow (cfs) | Ripogenus Dam Fisheries Flow (cfs) | Total Flow (cfs) | Operational Notes |
|---|---|---|---|---|
| 07-Sep-21 17:01:00 | 1,910 | 90 | 2,000 | Whitewater recreation flow |
| 07-Sep-21 17:02:00 | 1,918 | 90 | 2,008 | |
| 07-Sep-21 17:03:00 | 1,779 | 90 | 1,869 | Flow reduction for water conservation, due to drought |
| 07-Sep-21 17:04:00 | 1,599 | 90 | 1,689 | |
| 07-Sep-21 17:05:00 | 1,407 | 90 | 1,497 | |
| 07-Sep-21 17:06:00 | 1,111 | 90 | 1,201 | |
| 07-Sep-21 17:07:00 | 1,107 | 90 | 1,197 | |
| 07-Sep-21 17:08:00 | 1,082 | 90 | 1,172 | |
| 07-Sep-21 17:09:00 | 1,095 | 90 | 1,185 | |
| 07-Sep-21 17:10:00 | 1,076 | 90 | 1,166 | |
| 07-Sep-21 17:11:00 | 1,058 | 90 | 1,148 | |
| 07-Sep-21 17:12:00 | 1,057 | 90 | 1,147 | |
| 07-Sep-21 17:13:00 | 1,059 | 90 | 1,149 | |
| 07-Sep-21 17:14:00 | 1,059 | 90 | 1,149 | |
| 07-Sep-21 17:15:00 | 1,056 | 90 | 1,146 | |
| 07-Sep-21 17:16:00 | 1,062 | 90 | 1,152 | |
| 07-Sep-21 17:17:00 | 1,062 | 90 | 1,152 | |
| 07-Sep-21 17:18:00 | 1,063 | 90 | 1,153 | |
| 07-Sep-21 17:19:00 | 1,063 | 90 | 1,153 | |
| 07-Sep-21 17:20:00 | 1,062 | 90 | 1,152 | |
| 07-Sep-21 17:21:00 | 1,059 | 90 | 1,149 | |
| 07-Sep-21 17:22:00 | 1,061 | 90 | 1,151 | |
| 07-Sep-21 17:23:00 | 1,064 | 90 | 1,154 | |
| 07-Sep-21 17:24:00 | 1,064 | 90 | 1,154 | |
| 07-Sep-21 17:25:00 | 1,063 | 90 | 1,153 | |
| 07-Sep-21 17:26:00 | 1,061 | 90 | 1,151 | |
| 07-Sep-21 17:27:00 | 1,062 | 90 | 1,152 | |
| 07-Sep-21 17:28:00 | 1,064 | 90 | 1,154 | |
| 07-Sep-21 17:29:00 | 1,054 | 90 | 1,144 | |
| 07-Sep-21 17:30:00 | 1,052 | 90 | 1,142 | |
| 07-Sep-21 17:31:00 | 1,049 | 90 | 1,139 | |
| 07-Sep-21 17:32:00 | 1,049 | 90 | 1,139 | |
| 07-Sep-21 17:33:00 | 1,048 | 90 | 1,138 | |
| 07-Sep-21 17:34:00 | 1,046 | 90 | 1,136 | |
| 07-Sep-21 17:35:00 | 1,042 | 90 | 1,132 | |
| 07-Sep-21 17:36:00 | 1,045 | 90 | 1,135 | |
| 07-Sep-21 17:37:00 | 1,043 | 90 | 1,133 | |
| 07-Sep-21 17:38:00 | 1,044 | 90 | 1,134 | |
| 07-Sep-21 17:39:00 | 1,046 | 90 | 1,136 | |
| 07-Sep-21 17:40:00 | 1,046 | 90 | 1,136 | |
| 07-Sep-21 17:41:00 | 1,046 | 90 | 1,136 | |
| 07-Sep-21 17:42:00 | 1,043 | 90 | 1,133 | |
| 07-Sep-21 17:43:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 17:44:00 | 1,042 | 90 | 1,132 | |
| 07-Sep-21 17:45:00 | 1,042 | 90 | 1,132 | |
| 07-Sep-21 17:46:00 | 1,045 | 90 | 1,135 | |
| 07-Sep-21 17:47:00 | 1,046 | 90 | 1,136 | |
| 07-Sep-21 17:48:00 | 1,046 | 90 | 1,136 | |
| 07-Sep-21 17:49:00 | 1,045 | 90 | 1,135 | |
| 07-Sep-21 17:50:00 | 1,045 | 90 | 1,135 | |
| 07-Sep-21 17:51:00 | 1,045 | 90 | 1,135 | |
| 07-Sep-21 17:52:00 | 1,045 | 90 | 1,135 | |
| 07-Sep-21 17:53:00 | 1,044 | 90 | 1,134 | |

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| 07-Sep-21 17:54:00 | 1,042 | 90 | 1,132 | |
| 07-Sep-21 17:55:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 17:56:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 17:57:00 | 1,042 | 90 | 1,132 | |
| 07-Sep-21 17:58:00 | 1,045 | 90 | 1,135 | |
| 07-Sep-21 17:59:00 | 1,045 | 90 | 1,135 | |
| 07-Sep-21 18:00:00 | 1,042 | 90 | 1,132 | |
| 07-Sep-21 18:01:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 18:02:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 18:03:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 18:04:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 18:05:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 18:06:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 18:07:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 18:08:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 18:09:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 18:10:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 18:11:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 18:12:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 18:13:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 18:14:00 | 1,042 | 90 | 1,132 | |
| 07-Sep-21 18:15:00 | 1,043 | 90 | 1,133 | |
| 07-Sep-21 18:16:00 | 1,045 | 90 | 1,135 | |
| 07-Sep-21 18:17:00 | 1,045 | 90 | 1,135 | |
| 07-Sep-21 18:18:00 | 1,046 | 90 | 1,136 | |
| 07-Sep-21 18:19:00 | 1,044 | 90 | 1,134 | |
| 07-Sep-21 18:20:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 18:21:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 18:22:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 18:23:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 18:24:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 18:25:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 18:26:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 18:27:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 18:28:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 18:29:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 18:30:00 | 1,041 | 90 | 1,131 | Minimum flow excursion alleged to begin at approximately 18:30 hrs |
| 07-Sep-21 18:31:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 18:32:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 18:33:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 18:34:00 | 1,036 | 90 | 1,126 | |
| 07-Sep-21 18:35:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 18:36:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 18:37:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 18:38:00 | 1,034 | 90 | 1,124 | |
| 07-Sep-21 18:39:00 | 1,034 | 90 | 1,124 | |
| 07-Sep-21 18:40:00 | 1,034 | 90 | 1,124 | |
| 07-Sep-21 18:41:00 | 1,036 | 90 | 1,126 | |
| 07-Sep-21 18:42:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 18:43:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 18:44:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 18:45:00 | 1,035 | 90 | 1,125 | |
| 07-Sep-21 18:46:00 | 1,036 | 90 | 1,126 | |
| 07-Sep-21 18:47:00 | 1,035 | 90 | 1,125 | |
| 07-Sep-21 18:48:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 18:49:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 18:50:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 18:51:00 | 1,036 | 90 | 1,126 | |

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| 07-Sep-21 18:52:00 | 1,036 | 90 | 1,126 | |
| 07-Sep-21 18:53:00 | 1,036 | 90 | 1,126 | |
| 07-Sep-21 18:54:00 | 1,036 | 90 | 1,126 | |
| 07-Sep-21 18:55:00 | 1,034 | 90 | 1,124 | |
| 07-Sep-21 18:56:00 | 1,035 | 90 | 1,125 | |
| 07-Sep-21 18:57:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 18:58:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 18:59:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 19:00:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 19:01:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 19:02:00 | 1,044 | 90 | 1,134 | |
| 07-Sep-21 19:03:00 | 1,047 | 90 | 1,137 | |
| 07-Sep-21 19:04:00 | 1,047 | 90 | 1,137 | |
| 07-Sep-21 19:05:00 | 1,048 | 90 | 1,138 | |
| 07-Sep-21 19:06:00 | 1,050 | 90 | 1,140 | |
| 07-Sep-21 19:07:00 | 1,050 | 90 | 1,140 | |
| 07-Sep-21 19:08:00 | 1,044 | 90 | 1,134 | |
| 07-Sep-21 19:09:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 19:10:00 | 1,042 | 90 | 1,132 | |
| 07-Sep-21 19:11:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 19:12:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 19:13:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 19:14:00 | 1,042 | 90 | 1,132 | |
| 07-Sep-21 19:15:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 19:16:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 19:17:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 19:18:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 19:19:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 19:20:00 | 1,036 | 90 | 1,126 | |
| 07-Sep-21 19:21:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 19:22:00 | 1,043 | 90 | 1,133 | |
| 07-Sep-21 19:23:00 | 1,046 | 90 | 1,136 | |
| 07-Sep-21 19:24:00 | 1,046 | 90 | 1,136 | |
| 07-Sep-21 19:25:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 19:26:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 19:27:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 19:28:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 19:29:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 19:30:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 19:31:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 19:32:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 19:33:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 19:34:00 | 1,035 | 90 | 1,125 | |
| 07-Sep-21 19:35:00 | 1,036 | 90 | 1,126 | |
| 07-Sep-21 19:36:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 19:37:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 19:38:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 19:39:00 | 1,042 | 90 | 1,132 | |
| 07-Sep-21 19:40:00 | 1,042 | 90 | 1,132 | |
| 07-Sep-21 19:41:00 | 1,043 | 90 | 1,133 | |
| 07-Sep-21 19:42:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 19:43:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 19:44:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 19:45:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 19:46:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 19:47:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 19:48:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 19:49:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 19:50:00 | 1,040 | 90 | 1,130 | |

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|---|---|---|---|---|
| 07-Sep-21 19:51:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 19:52:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 19:53:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 19:54:00 | 1,034 | 90 | 1,124 | |
| 07-Sep-21 19:55:00 | 1,034 | 90 | 1,124 | |
| 07-Sep-21 19:56:00 | 1,034 | 90 | 1,124 | |
| 07-Sep-21 19:57:00 | 1,036 | 90 | 1,126 | |
| 07-Sep-21 19:58:00 | 1,036 | 90 | 1,126 | |
| 07-Sep-21 19:59:00 | 1,036 | 90 | 1,126 | |
| 07-Sep-21 20:00:00 | 1,036 | 90 | 1,126 | |
| 07-Sep-21 20:01:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 20:02:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 20:03:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 20:04:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 20:05:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 20:06:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 20:07:00 | 1,042 | 90 | 1,132 | |
| 07-Sep-21 20:08:00 | 1,044 | 90 | 1,134 | |
| 07-Sep-21 20:09:00 | 1,042 | 90 | 1,132 | |
| 07-Sep-21 20:10:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 20:11:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 20:12:00 | 1,042 | 90 | 1,132 | |
| 07-Sep-21 20:13:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 20:14:00 | 1,042 | 90 | 1,132 | |
| 07-Sep-21 20:15:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 20:16:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 20:17:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 20:18:00 | 1,044 | 90 | 1,134 | |
| 07-Sep-21 20:19:00 | 1,042 | 90 | 1,132 | |
| 07-Sep-21 20:20:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 20:21:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 20:22:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 20:23:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 20:24:00 | 1,043 | 90 | 1,133 | |
| 07-Sep-21 20:25:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 20:26:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 20:27:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 20:28:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 20:29:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 20:30:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 20:31:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 20:32:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 20:33:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 20:34:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 20:35:00 | 1,043 | 90 | 1,133 | |
| 07-Sep-21 20:36:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 20:37:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 20:38:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 20:39:00 | 1,034 | 90 | 1,124 | |
| 07-Sep-21 20:40:00 | 1,036 | 90 | 1,126 | |
| 07-Sep-21 20:41:00 | 1,034 | 90 | 1,124 | |
| 07-Sep-21 20:42:00 | 1,034 | 90 | 1,124 | |
| 07-Sep-21 20:43:00 | 1,035 | 90 | 1,125 | |
| 07-Sep-21 20:44:00 | 1,035 | 90 | 1,125 | |
| 07-Sep-21 20:45:00 | 1,034 | 90 | 1,124 | |
| 07-Sep-21 20:46:00 | 1,032 | 90 | 1,122 | |
| 07-Sep-21 20:47:00 | 1,033 | 90 | 1,123 | |
| 07-Sep-21 20:48:00 | 1,033 | 90 | 1,123 | |
| 07-Sep-21 20:49:00 | 1,032 | 90 | 1,122 | |

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| 07-Sep-21 20:50:00 | 1,033 | 90 | 1,123 | |
| 07-Sep-21 20:51:00 | 1,033 | 90 | 1,123 | |
| 07-Sep-21 20:52:00 | 1,034 | 90 | 1,124 | |
| 07-Sep-21 20:53:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 20:54:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 20:55:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 20:56:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 20:57:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 20:58:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 20:59:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 21:00:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 21:01:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 21:02:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 21:03:00 | 1,042 | 90 | 1,132 | |
| 07-Sep-21 21:04:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 21:05:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 21:06:00 | 1,036 | 90 | 1,126 | |
| 07-Sep-21 21:07:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 21:08:00 | 1,036 | 90 | 1,126 | |
| 07-Sep-21 21:09:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 21:10:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 21:11:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 21:12:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 21:13:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 21:14:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 21:15:00 | 1,036 | 90 | 1,126 | |
| 07-Sep-21 21:16:00 | 1,035 | 90 | 1,125 | |
| 07-Sep-21 21:17:00 | 1,035 | 90 | 1,125 | |
| 07-Sep-21 21:18:00 | 1,036 | 90 | 1,126 | |
| 07-Sep-21 21:19:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 21:20:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 21:21:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 21:22:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 21:23:00 | 1,043 | 90 | 1,133 | |
| 07-Sep-21 21:24:00 | 1,044 | 90 | 1,134 | |
| 07-Sep-21 21:25:00 | 1,042 | 90 | 1,132 | |
| 07-Sep-21 21:26:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 21:27:00 | 1,036 | 90 | 1,126 | |
| 07-Sep-21 21:28:00 | 1,036 | 90 | 1,126 | |
| 07-Sep-21 21:29:00 | 1,036 | 90 | 1,126 | |
| 07-Sep-21 21:30:00 | 1,036 | 90 | 1,126 | |
| 07-Sep-21 21:31:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 21:32:00 | 1,035 | 90 | 1,125 | |
| 07-Sep-21 21:33:00 | 1,034 | 90 | 1,124 | |
| 07-Sep-21 21:34:00 | 1,035 | 90 | 1,125 | |
| 07-Sep-21 21:35:00 | 1,035 | 90 | 1,125 | |
| 07-Sep-21 21:36:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 21:37:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 21:38:00 | 1,042 | 90 | 1,132 | |
| 07-Sep-21 21:39:00 | 1,042 | 90 | 1,132 | |
| 07-Sep-21 21:40:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 21:41:00 | 1,042 | 90 | 1,132 | |
| 07-Sep-21 21:42:00 | 1,045 | 90 | 1,135 | |
| 07-Sep-21 21:43:00 | 1,047 | 90 | 1,137 | |
| 07-Sep-21 21:44:00 | 1,045 | 90 | 1,135 | |
| 07-Sep-21 21:45:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 21:46:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 21:47:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 21:48:00 | 1,036 | 90 | 1,126 | |

| | | | | |
|---|---|---|---|---|
| 07-Sep-21 21:49:00 | 1,038 | 90 | 1,128 | |
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| 07-Sep-21 21:53:00 | 1,040 | 90 | 1,130 | |
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| 07-Sep-21 22:03:00 | 1,040 | 90 | 1,130 | |
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| 07-Sep-21 22:05:00 | 1,047 | 90 | 1,137 | |
| 07-Sep-21 22:06:00 | 1,047 | 90 | 1,137 | |
| 07-Sep-21 22:07:00 | 1,043 | 90 | 1,133 | |
| 07-Sep-21 22:08:00 | 1,041 | 90 | 1,131 | |
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| 07-Sep-21 22:13:00 | 1,041 | 90 | 1,131 | |
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| 07-Sep-21 22:22:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 22:23:00 | 1,044 | 90 | 1,134 | |
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| 07-Sep-21 22:26:00 | 1,041 | 90 | 1,131 | |
| 07-Sep-21 22:27:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 22:28:00 | 1,037 | 90 | 1,127 | |
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| 07-Sep-21 22:45:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 22:46:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 22:47:00 | 1,036 | 90 | 1,126 | |

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|---|---|---|---|---|
| 07-Sep-21 22:48:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 22:49:00 | 1,036 | 90 | 1,126 | |
| 07-Sep-21 22:50:00 | 1,033 | 90 | 1,123 | |
| 07-Sep-21 22:51:00 | 1,032 | 90 | 1,122 | |
| 07-Sep-21 22:52:00 | 1,033 | 90 | 1,123 | |
| 07-Sep-21 22:53:00 | 1,033 | 90 | 1,123 | |
| 07-Sep-21 22:54:00 | 1,032 | 90 | 1,122 | |
| 07-Sep-21 22:55:00 | 1,033 | 90 | 1,123 | |
| 07-Sep-21 22:56:00 | 1,032 | 90 | 1,122 | |
| 07-Sep-21 22:57:00 | 1,033 | 90 | 1,123 | |
| 07-Sep-21 22:58:00 | 1,035 | 90 | 1,125 | |
| 07-Sep-21 22:59:00 | 1,034 | 90 | 1,124 | |
| 07-Sep-21 23:00:00 | 1,035 | 90 | 1,125 | |
| 07-Sep-21 23:01:00 | 1,033 | 90 | 1,123 | |
| 07-Sep-21 23:02:00 | 1,032 | 90 | 1,122 | |
| 07-Sep-21 23:03:00 | 1,033 | 90 | 1,123 | |
| 07-Sep-21 23:04:00 | 1,039 | 90 | 1,129 | |
| 07-Sep-21 23:05:00 | 1,042 | 90 | 1,132 | |
| 07-Sep-21 23:06:00 | 1,048 | 90 | 1,138 | |
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| 07-Sep-21 23:08:00 | 1,051 | 90 | 1,141 | |
| 07-Sep-21 23:09:00 | 1,050 | 90 | 1,140 | |
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| 07-Sep-21 23:33:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 23:34:00 | 1,040 | 90 | 1,130 | |
| 07-Sep-21 23:35:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 23:36:00 | 1,035 | 90 | 1,125 | |
| 07-Sep-21 23:37:00 | 1,034 | 90 | 1,124 | |
| 07-Sep-21 23:38:00 | 1,037 | 90 | 1,127 | |
| 07-Sep-21 23:39:00 | 1,039 | 90 | 1,129 | |
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| 07-Sep-21 23:44:00 | 1,043 | 90 | 1,133 | |
| 07-Sep-21 23:45:00 | 1,044 | 90 | 1,134 | |
| 07-Sep-21 23:46:00 | 1,039 | 90 | 1,129 | |

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|---|---|---|---|---|
| 07-Sep-21 23:47:00 | 1,038 | 90 | 1,128 | |
| 07-Sep-21 23:48:00 | 1,036 | 90 | 1,126 | |
| 07-Sep-21 23:49:00 | 1,035 | 90 | 1,125 | |
| 07-Sep-21 23:50:00 | 1,034 | 90 | 1,124 | |
| 07-Sep-21 23:51:00 | 1,034 | 90 | 1,124 | |
| 07-Sep-21 23:52:00 | 1,032 | 90 | 1,122 | |
| 07-Sep-21 23:53:00 | 1,032 | 90 | 1,122 | |
| 07-Sep-21 23:54:00 | 1,032 | 90 | 1,122 | |
| 07-Sep-21 23:55:00 | 1,034 | 90 | 1,124 | |
| 07-Sep-21 23:56:00 | 1,034 | 90 | 1,124 | |
| 07-Sep-21 23:57:00 | 1,033 | 90 | 1,123 | |
| 07-Sep-21 23:58:00 | 1,033 | 90 | 1,123 | |
| 07-Sep-21 23:59:00 | 1,032 | 90 | 1,122 | |
| 08-Sep-21 00:00:00 | 1,032 | 90 | 1,122 | |

# Attachment C

## Stranding Evaluation Study

***Goals and Objectives***

The study will provide information regarding the potential for fish stranding associated with the Ripogenus Project. The study objective is to determine the extent and degree of danger stranding pools that occur from below the McKay Station discharge to Nesowadnehunk Falls, especially under 400 cfs generator trip events.

***Known Resource Management Goals*** (Under §5.9(b)(3) If the requester is a not a source agency, explain any relevant public Interest.)

The requestor, Maine Council of TU, is a non-governmental organization (NGO).

Maine's rivers, great ponds and wildlife are, by law, public resources. The West Branch of the Penobscot is one of the areas in Maine that TU members most prefer for fishing and other recreational activities, and thus TU has a direct interest in the waters affected by project operations, especially those from Ripogenus Dam to below Nesowadnehunk Falls.

***Background and Existing Information***

There is no existing information regarding stranding-prone areas or operational scenarios for the Ripogenus Project. This study is needed to quantify project effects on a potential source of fish mortality and injury.

***Project Nexus***

Generator trip events at McKay Station occur with some frequency and it is a matter of record that two such events occurred during the August-September timeframe of 2021 when strandings were photographically documented.[1] It is hard to image aspects of project operations that could have a more direct relationship with the welfare of aquatic organisms than immediate, drastic flow reductions.

***Methodology***

Task 1: Operational Data Review:

> Prior to conducting the field investigation, a desktop literature review will be performed to gather information on the range of flows when generator trip events are likely to occur. We anticipate that since thunderstorms occur during the summer, whitewater flows generally of 2200 – 1800 cfs would generally be in effect when the outages occur.

Task 2: Field Surveys:

> The field survey will consist of a reconnaissance level evaluation where a field crew will examine potential stranding sites in the study area at an appropriate time interval after

[1] TU Letter dated September 21, 2021, Subject: Maine Council of Trout Unlimited Report of Observed Low Flow Events for the Ripogenus Project (P-2572); TU Letter dated January 5, 2022, Subject: Maine Council of Trout Unlimited Amplifying Report for Observed Low Flow Events for the Ripogenus Project (P-2572).

spilling operations have ceased. Any accessible pools with fish stranding potential will be identified and visited shortly after the spillage event. On-ground surveys will traverse any pools and visually document fish present as well as looking for fish trapped under rocks. Information on the number and location of fish stranded will be recorded. In addition, the conditions of the study area will be photo-documented.

***Consistency with Generally Accepted Scientific Practice***

The proposed survey to document potential stranding areas is an accepted means of documenting species use in the Project area.

***Deliverables and Schedule***

The survey effort will be conducted during the summer/fall of 2022. Data and results will be included in the Initial Study Report to be filed with FERC in 2023.

***Cost and Level of Effort***

The estimated cost for the stranding evaluation is approximately $20,000. This level of effort is consistent with the size of project operations.

The Applicant may be able to combine this study with any testing of equipment and procedures ordered by the FERC Compliance Division as part of its investigation in the low flow events previously referenced, especially generator trip events. This could provide significant cost savings lowering the cost estimate provided above.

# Attachment D

September 21, 2021

Ms. Kimberly D. Bose
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Via online submission to: http://www/ferc.gov (cross-filed)**

Subject: **Maine Council of Trout Unlimited Report of Observed Low Flow Events for the Ripogenus Project (P-2572)**

Dear Secretary Bose:

On behalf of its six chapters and over 2,000 members, Maine Council of Trout Unlimited (TU) submits this report of low flow events for the Ripogenus Project (P-2572). The land-locked salmon fishery below Ripogenus Dam is sustained by naturally spawned fish and nationally known for its quality. Project operations directly affect the fishing activities of our members.

On August 30, 2021, an apparent flow excursion was witnessed below Ripogenus Dam by Chewonki Campground staff and who informed TU of the event and provided photos. Such events have been occurring for the last ten years or more, but seem to be on the increase of late. The operator has generally reported them within ten days of their occurrence and we expected that to be case in this instance, but that has yet to occur. On September 13, TU called the FERC hotline and spoke with FERC official Mark Carter who explained that he would pass the information to appropriate FERC staff and that someone would be in contact with us. Hearing nothing back, we called again on September 15, and received the same assurance. On September 16, we were contacted by FERC official Alicia Burtner.[1] She explained how to report the event using FERC Online. Later that day, Chewonki Campground staff reported witnessing another low flow event. Rather than wait and file a separate report, we are including that event in this filing with the August 30 event.

To complicate matters, subsequent to the drafting of this report, Brookfield reported an excursion event that occurred on September 10, 2021.[2] This event was observed by TU contacts in the area who did not consider it problematic. It does not correlate with either of the flow events contained in this report.

**August 30, 2021 Event**

On that date, Sarah Sindo, Chewonki Campground Manager, reported that there had been a significant drop in the river similar to previous occurrences. At about noon, the river level dropped to 300-400 cfs and remained that flow until about 3pm. A thunder and lightning storm rolled through the area and there were rumblings that the outage was caused by a lightning strike. The Campground received no notification from the project operator. Prior to the event, flows at been running 1800 cfs. In further correspondence, Sarah reported that Maine Guide Mike McVey had observed both fish and macro-invertebrate strandings near the Cribworks (just downstream of Telos Bridge).

[1] Phone conversation, Stephen Heinz of TU and Alicia Burtner of FERC staff, September 16, 2021.
[2] Brookfield letter Subject: Ripogenus Project (FERC No. 2572);Whitewater Recreation Minimum Flow Excursion dated September 20, 2021, FERC Accession number 20210920-5168.

Photographs were taken that are provided on the following pages along with the location and photographer. The Big Eddy is a large, deep pool that cannot be fully dewatered because of the height at the outlet. Water levels in the photos are close to the limit of hydraulic controls.

Photos by Julie Puleio



Big Eddy Pool looking downstream from Big Eddy Campground

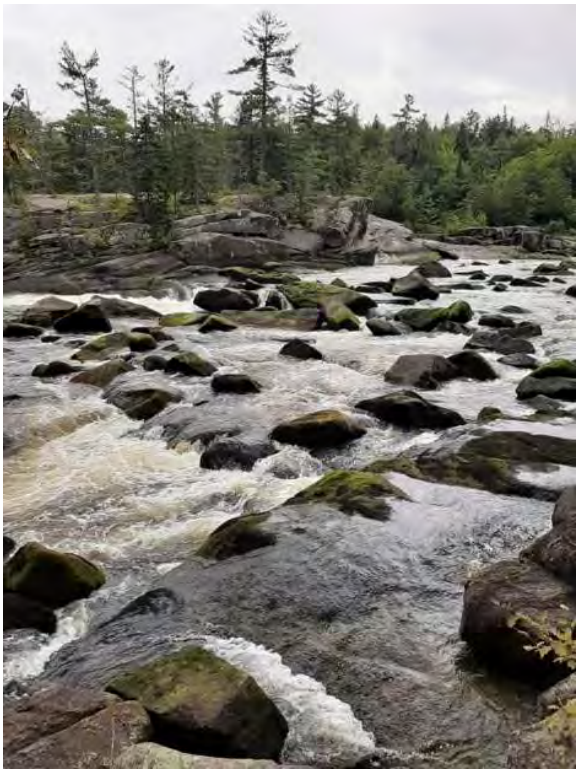


Big Eddy Pool looking upstream toward the Cribworks from Big Eddy Campground

Photos by Mike McVey



Downstream from Telos Bridge



Downstream from the Cribworks



Downstream from the Cribworks



Downstream into Ripogenus Gorge

**September 16, 2021 Event**

On this date, Sarah Sindo, Chewonki Campground Manager, reported that there had been another significant flow event that morning around 8 a.m. when she noticed the river was way down and not rising to the scheduled 1800 cfs. She looked at the Brookfield water flow website and it read 400 cfs. When Maine Guide Mike McKenzie asked her about flows, she replied that she wasn't sure what was going on. Before she shuttled him down to the Little A (base of Amberjackwockamus Falls) takeout, she looked at the website again and it read 600 cfs. She then emailed Mike Osborne of Brookfield asking what the flow was scheduled to be today because there wasn't anything specific listed. He responded: "The hydro stations all tripped offline due to a problem at the utility tie. McKay station is running on the min flow system at the moment. Not sure how long it is going to be before we can normalize. Sorry I don’t have more information, but we’re dealing with this as quickly as possible." Low flows persisted until 12:30 or 1:00.

Here is a picture that Maine Guide Kevin McKay took at the Little A takeout documenting the low flow event.



**Other Information**

The flow regime for the Ripogenus Project is complex, minimum flows are 1000 cfs[3] - for your convenience we are providing them as Attachment A as they appear in the Pre-application Document (PAD) for the project's relicensing currently in progress.

A number of flow excursions have occurred at the Ripogenus Project over the years prior to these most recent ones. For your convenience, we have listed them in the following table:

| Filed | Docket(s) | Description | Remarks |
|---|---|---|---|
| 7/15/11 | P-2572-119 | Report Minimum Flow Excursion Event at the Ripogenus Development P-2572 Dated 20110715. | Failed to open sluice gate by July 1 to provide 100 cfs through upper gorge. FERC ruled this a violation |
| 6/23/15 | P-2572-121 | 20150623 Flow Excursion due to McKay Station Outage Ripogenus Project; Compliance Article 402 under under P-2572. | 100 cfs for 63 minutes<br><br>FERC took action |
| 8/24/15 | P-2458-211<br><br>P-2572-122 | 20150824 Ripogenus Project 2572; Article 402; Penobscot Mills P-2458; Article 403 Compliance; Flow Excursion due to Transmission Line Trip and Station Outages | Have photos.<br><br>All three generators tripped due to cross arm failure Flows below 400 cfs for 2 hours 18 minutes |
| 6/19/17 (actual event date) | N/A | Flow excursion without corresponding report | Have photos |
| 12/18/18 | P-2572-125 | 20181218 Ripogenus Project 2572-ME; Minimum Flow Excursion | 933 cfs plus leakage flow for 2 hours 5 minutes during spawning flow period.<br><br>No photos. |
| 4/24/19 | P-2458-229<br><br>P-2572-126 | 20190424 Penobscot Mills P-2458; Ripogenus Project P-2572; Minimum Flow Excursions due to Suspected Lightning Strike | 906 cfs for 2 hours 55 minutes during spawning flow period on April 14, 2019<br><br>No photos. |
| 3/12/21 | P-2572-129 | Great Lakes Hydro America, LLC submits Minimum Flow Excursion for the Ripogenus Project under P-2572. | All three generators tripped due to cross arm failure Flows below 900 cfs for 5 hours 44 minutes on March 2, 2021<br>No photos |

[3] Brookfield Pre-application Document for Ripogenus Project (FERC No. 2572) dated June 11, 2021, Section 4.

From information provided in response to TU questions at the scoping meeting for agencies and NGOs held September 9, repair crews must come from Millinocket to restore required flows after an excursion. Manual operations are required. TU believes that based on past outages, over two hours is the minimum time required to restore flows.

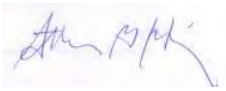
**Conclusions and Request**

TU finds it troubling that these flow events continue to occur - even more so when they are not reported as remains the case for the August 30 and September 16 events and apparently for the June 19, 2017 event noted above. Since the campground is not manned and use is minimal during the winter months, we wonder how many unreported excursions have occurred over the years. Of additional note: the Commission required follow-up on the June 13, 2015 excursion that was reported by Brookfield's letter that we have included as Attachment B.[4] While this action may have corrected problems with the minimum flow system, low flow events continue to be a problem for the Ripogenus Project and the minimum time need to restore target flows appears to be over two hours with adverse consequences to fish and other aquatic organisms as well as to the fishing and whitewater rafting activities.

TU requests that the Commission investigate these unreported flow events; determine magnitude, timing, and cause; require the operator to provide any required reports; and take appropriate follow-up action. License conditions exist to balance project harms and benefits. In the absence of compliance with project terms and conditions, it must be assumed that project operations do more harm than good.

Maine TU Council appreciates the Commission's attention to this matter.

Sincerely and respectfully,



Stephen G. Heinz
Maine TU Council FERC Coordinator

Attachments:

A. Description of Project Operations from PAD
B. Brookfield letter reporting correction of problems with the Minimum flow system

E-mail Courtesy Copies:

Mark Carter, Alicia Burtner, Sarah Sindo, John Spain, Mike McKenzie, Stephen McVey, Julie Puleio

[4] Brookfield letter RE: Ripogenus Project 2572, Article 402 Compliance; Follow-up to June 13, 2015 Flow Excursion due to McKay Station Outage

## 4.4 Project Operations

The Ripogenus and Penobscot Mills Projects are operated as a combined system. A diagram depicting the current operational requirements for the Projects and the associated flow of water through the system is provided as Figure 4.4-1.

### 4.4.1 Ripogenus Project

As established through the previous relicensing, the Ripogenus Project operates as a store-and-release development with an annual seasonal drawdown that allows for management of water levels and flows downstream of the Ripogenus Project, including the downstream reaches of the West Branch and the mainstem of the Penobscot River. As recognized by the stakeholders involved in the previous relicensing, the operations of the Ripogenus Project serve as a re-regulating impoundment that works in coordination with the upstream Storage Project (FERC No. 2634) and the downstream North Twin and Millinocket Lake Developments (of the Penobscot Mills Project) to maximize the balancing of downstream flows and water levels in support of flood control, public safety, dam safety, supplemental flows during seasonal low flow periods, fish spawning and migration, recreation, whitewater boating, water quality, local electrical grid stability, and baseload renewable energy generation. In particular, the size of the Ripogenus impoundment in combination with the Project's operational flexibility provides the storage resource that minimizes the detrimental effects of natural high and low water periods within the larger Penobscot River basin.

The Ripogenus Project impoundment, in combination with the upstream Storage Project and the downstream North Twin and Millinocket Lake developments, provide stakeholders of the larger Penobscot River basin with a valuable re-regulating tool to manage river flows in support of stakeholder interests. Without the existing storage capacity and operational flexibility developed by the stakeholders through the previous relicensings, the basin and downstream river users would be routinely subject to higher variable flows throughout the system – including flooding, public safety, dam safety and environmental impacts throughout the downstream reaches.

The Project's impoundment is managed on an annual cycle to dampen the variability and occasional extremes of seasonal precipitation and runoff through storage within the impoundment.



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This storage allows for continuous flows to downstream aquatic habitat and spawning areas within the West Branch and the mainstem of the Penobscot River during times of lower inflows to the system. In addition, the storage allows flows from the West Branch to be reduced during higher seasonal flow periods when the combined flows from the East and West Branches have the potential to adversely impact human life, property, and environmental resources downstream along the mainstem Penobscot River.

Normal full pond elevation of the Ripogenus impoundment is 941.6 feet with a maximum drawdown of 44 feet (based on operational limitations of the Project). During normal operations, the Ripogenus impoundment is maintained between normal full pond elevation (941.6 feet) following seasonal inflow to the impoundment and a target elevation of 913.6 feet prior to the seasonal inflow, which equates to a target seasonal drawdown range of 28 feet.

During normal operations and normal inflow years, the Ripogenus impoundment elevation is held relatively stable during the summer months and is gradually drawn down starting in the fall with a target low elevation by late winter in anticipation for the spring thaw and freshet. In the spring, the Ripogenus impoundment elevation rises based on inflows from the upstream Storage Project, spring thaw, and precipitation with the goal to reach normal full pond elevation by late spring. In this capacity, as compared to allowing these inflows to be released to the downstream reaches and potentially causing flooding, public safety, and dam safety impacts, the Project acts as a re-regulating impoundment in support of providing a more constant flow for downstream resources and impacts.

In support of managing the impoundment levels and downstream flows, GLHA tracks seasonal inflows to the impoundment (e.g., through snow surveys). As recognized by Project stakeholders, even with significant efforts to estimate inflows to the impoundment, the system is subject to natural variability in regional precipitation, which results in events such as 10-year and 100-year storm events, as well as low inflow or drought events (e.g., 2002 and 2020-2021).

Under the Project's existing license, GLHA is provided the flexibility to provide the required minimum flows in support of aquatic and riverine resources, while providing the tools to help



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reduce the potential impacts (e.g., flooding, public safety, and dam safety) resulting from higher water years.

Pursuant to Article 401 of the existing license, a minimum flow of 100 cfs is released from Ripogenus Dam into the bypassed reach (Upper Gorge) from July 1 through September 30 annually. Consistent with the August 19, 1997 FERC order approving and modifying the Water Management Plan, the minimum flows into the Upper Gorge are released through the sluice gates at the north end of the dam. During the remainder of the year, a minimum flow of 12 cfs is provided through leakage from Ripogenus Dam into the Upper Gorge. Releases from the Ripogenus Project enter the West Branch and flow 21 miles downstream (from McKay Station) into Ambajejus Lake, which is part of the North Twin Development of the Penobscot Mills Project.



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**Figure 4.4-1**
**Operational Requirements for the Ripogenus and Penobscot Mills Projects**

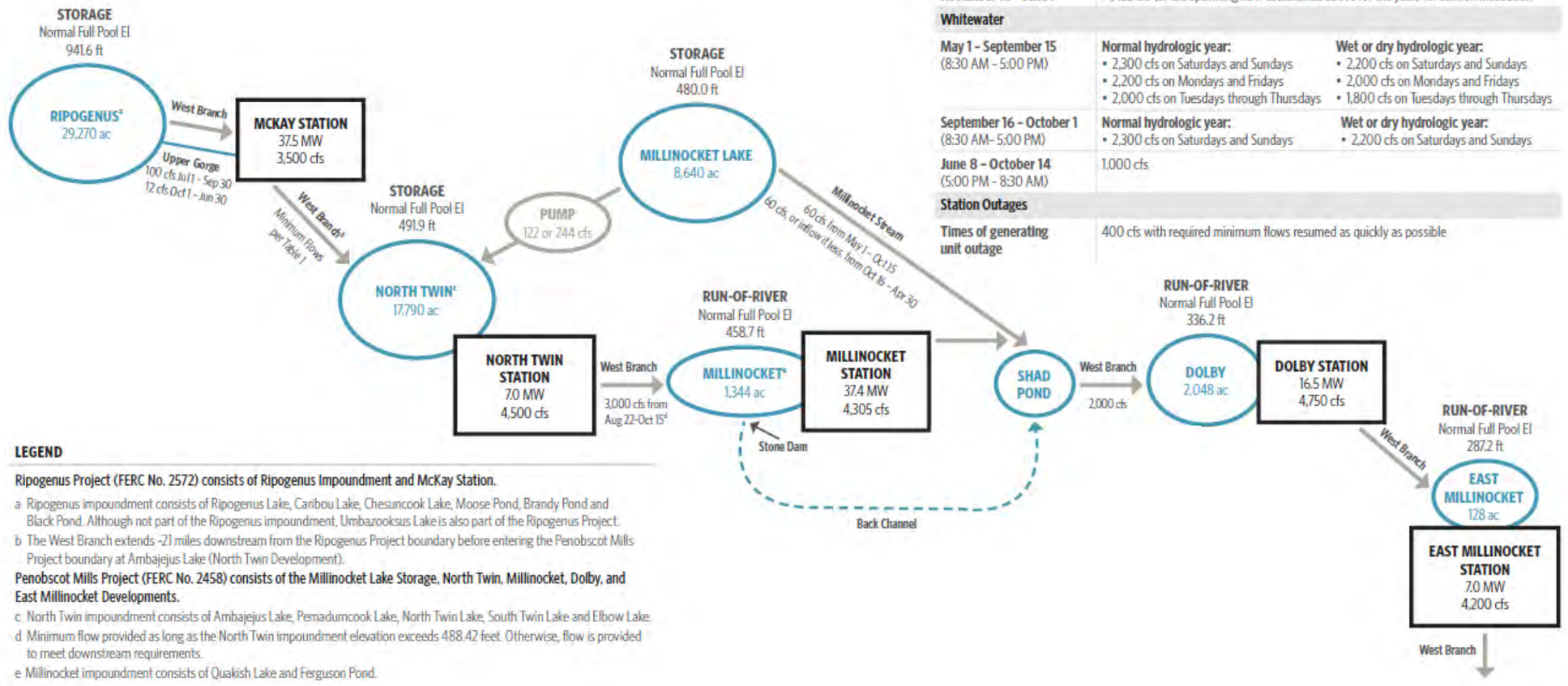



**Table 1:** McKay Station Minimum Flows

| PERIOD | MINIMUM FLOW REQUIREMENT | |
|---|---|---|
| **Fish Spawning or Incubation** | | |
| September 16 – October 14 | 1,000 cfs | |
| October 15 – November 15 | ≥1,422 cfs or inflow, but not less than 1,300 cfs for salmon spawning | |
| November 16 – June 7 | >1,422 cfs (or the spawning flow established above for the year) for salmon incubation | |
| **Whitewater** | | |
| May 1 – September 15 (8:30 AM – 5:00 PM) | **Normal hydrologic year:**<br>• 2,300 cfs on Saturdays and Sundays<br>• 2,200 cfs on Mondays and Fridays<br>• 2,000 cfs on Tuesdays through Thursdays | **Wet or dry hydrologic year:**<br>• 2,200 cfs on Saturdays and Sundays<br>• 2,000 cfs on Mondays and Fridays<br>• 1,800 cfs on Tuesdays through Thursdays |
| September 16 – October 1 (8:30 AM- 5:00 PM) | **Normal hydrologic year:**<br>• 2,300 cfs on Saturdays and Sundays | **Wet or dry hydrologic year:**<br>• 2,200 cfs on Saturdays and Sundays |
| June 8 – October 14 (5:00 PM – 8:30 AM) | 1,000 cfs | |
| **Station Outages** | | |
| Times of generating unit outage | 400 cfs with required minimum flows resumed as quickly as possible | |

**LEGEND**

**Ripogenus Project (FERC No. 2572) consists of Ripogenus Impoundment and McKay Station.**

a Ripogenus impoundment consists of Ripogenus Lake, Caribou Lake, Chesuncook Lake, Moose Pond, Brandy Pond and Black Pond. Although not part of the Ripogenus impoundment, Umbazooksus Lake is also part of the Ripogenus Project.

b The West Branch extends ~21 miles downstream from the Ripogenus Project boundary before entering the Penobscot Mills Project boundary at Ambajejus Lake (North Twin Development).

**Penobscot Mills Project (FERC No. 2458) consists of the Millinocket Lake Storage, North Twin, Millinocket, Dolby, and East Millinocket Developments.**

c North Twin impoundment consists of Ambajejus Lake, Pemadumcook Lake, North Twin Lake, South Twin Lake and Elbow Lake.

d Minimum flow provided as long as the North Twin impoundment elevation exceeds 488.42 feet. Otherwise, flow is provided to meet downstream requirements.

e Millinocket impoundment consists of Quakish Lake and Ferguson Pond.



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Article 402 of the existing license requires minimum flows downstream of McKay Station into the West Branch as specified in Table 4.4-1. These flows may be temporarily modified if required by operating emergencies beyond the control of the Licensee and for short periods upon agreement between the Licensee and the Maine Department of Environmental Protection (MDEP) and Land Use Planning Commission (LUPC). Minimum flows may also be modified (to outflow approximates inflow) if required by hydrologic conditions beyond the control of the Licensee upon mutual agreement between the Licensee, USFWS, MDEP, LUPC, and MDIFW. Consistent with the August 19, 1997 FERC order approving and modifying the Water Management Plan, changes in flows below McKay Station are accomplished through the turbines; however, if necessary, GLHA will open a gate at Ripogenus Dam to augment flows.

**Table 4.4-1**
**Minimum Flow Requirements downstream of McKay Station for the Ripogenus Project[1]**

| Date Range | Minimum Flow Requirement |
|---|---|
| ***Fish Spawning or Incubation*** | |
| September 16 – October 14 | 1,000 cfs to facilitate drawdown of the North Twin impoundment (part of the Penobscot Mills Project) |
| October 15 – November 15 | At least 1,422 cfs or inflow, but not less than 1,300 cfs[2] for salmon spawning |
| November 16 – June 7 | Greater than 1,422 cfs (or the spawning flow established above for the year)[2] for salmon incubation |
| ***Whitewater*** | |
| May 1 – September 15<br>(8:30 AM – 5:00 PM) | Normal hydrologic year[3]:<br>• 2,300 cfs on Saturdays and Sundays<br>• 2,200 cfs on Mondays and Fridays<br>• 2,000 cfs on Tuesdays through Thursdays<br>Wet or dry hydrologic year[3]:<br>• 2,200 cfs on Saturdays and Sundays<br>• 2,000 cfs on Mondays and Fridays<br>• 1,800 cfs on Tuesdays through Thursdays |
| September 16 – October 1<br>(8:30 AM– 5:00 PM) | Normal hydrologic year[3]:<br>• 2,300 cfs on Saturdays and Sundays<br>Wet or dry hydrologic year[3]:<br>• 2,200 cfs on Saturdays and Sundays |
| June 8 – October 14<br>(5:00 PM – 8:30 AM) | 1,000 cfs |
| ***Station Outages*** | |
| Times of generating unit outage | 400 cfs with scheduled minimum flows identified above in table to be resumed as quickly as possible by releases from Ripogenus Dam if necessary but in no event in more than three days following the initial outage |

[1] Minimum flows shall be the minimum flows for each hourly period measured on the basis of an hourly average.
[2] Flows to be established each year in consultation with the USFWS and MDIFW.
[3] The whitewater flow for each month from May through September is determined on the first day of each month based on an analysis of Total Available Water as described in the Water Use Plan in the application for new license filed with the Commission on December 17, 1991. The determination of "wet," "normal," or "dry" shall remain constant during the month based on the first day of the month classification. The range of "normal" available water



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represents the expected available water during normal hydrologic conditions. It is defined as the range between x-s and x+s, where "x" is the mean value and "s" is the standard deviation. Based on a statistical analysis, total available water would be expected to be within this "normal" range two-thirds of the time and outside of this range ("wet" or "dry" years) one-third of the time.

Pursuant to the February 20, 2003 FERC order approving the Habitat Improvement Plan under Article 406 of the existing license, GLHA manages flows from the West Branch into the "Holbrook Side Channel." The Holbrook Side Channel is a 1,400-foot-long channel located approximately 1.7 RM downstream from the Ripogenus Dam in which flow is diverted from the West Branch for landlocked salmon and brook trout spawning and rearing. Flow from the channel re-enters the West Branch approximately 1,000 feet downstream. Flows into the channel are controlled through two pipes, one of which is equipped with a valve that can be opened or closed to increase or reduce flow from the West Branch into the channel. Flows into the channel range from between approximately 35 and 65 cfs during normal operating conditions, depending on the amount of flow in the West Branch. Around June 1, GLHA closes the valve to reduce flow into the channel (for landlocked salmon and brook trout fry emergence and production). Around October 15, GLHA opens the valve to increase flow into the channel (for landlocked salmon and brook trout spawning).

### 4.4.2 Penobscot Mills Project

The five developments that comprise the Penobscot Mills Project are operated as an integrated system, primarily based on flows received from the Ripogenus Project. The two store-and-release developments (Millinocket Lake Storage and North Twin) are located upstream of the run-of-river developments (Millinocket, Dolby, and East Millinocket). The North Twin impoundment receives flow from the Ripogenus Project. The Millinocket Lake Storage Development is located on Millinocket Stream, which enters the West Branch downstream of the Millinocket Development. Water from Millinocket Lake is either pumped into Ambajejus Lake (part of the North Twin Development), which subsequently passes through the North Twin and Millinocket powerhouses, or it is released into Millinocket Stream, which enters the West Branch downstream of the Millinocket Development.



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Document Accession #: 20160107-5108 Filed Date: 01/07/2016

Attachment B

Brookfield

Brookfield Renewable Energy Group
New England Regional Operations Center
Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, Maine 04462

Tel 207.723.4341
Fax 207.723.3948
www.brookfieldrenewable.com

January 7, 2016

**FERC Project No. 2572**
**Article 402**

Secretary Kimberly S. Bose
Federal Energy Regulatory Commission
Mail Code: DLC, HL-11.2
888 First Street, N.E.
Washington, D.C. 20426

Dear Secretary Bose:

**RE: Ripogenus Project 2572, Article 402 Compliance;**
**Follow-up to June 13, 2015 Flow Excursion due to McKay Station Outage**

On June 23, 2015, Great Lakes Hydro America, LLC (GLHA), licensee for FERC Project No. 2572-ME (Ripogenus) in Maine, submitted an excursion report to the Commission to report an approximately one-hour reduction in outflow from the Project's McKay Station to the West Branch of the Penobscot River. As explained in the letter, the excursion occurred on June 13, 2015, due to a transmission line pole cross arm failure and a subsequent malfunction of the Station's minimum flow system (which is designed to ensure an outflow of 400 cfs during a station outage). GLHA committed in the letter to investigating and troubleshooting the cause of the minimum flow system malfunction and to update the Commission with any additional corrective measures after the malfunction is fully identified and rectified. The June 23 letter further stated that a sluice gate at Ripogenus Dam would be left open until GLHA is confident that the minimum flow system will function properly and provide the required 400 cfs flow during any subsequent station outages.

In its August 11, 2015 response, the Commission indicated that the June 13 minimum flow deviation would not be considered a violation of Article 402 of the Ripogenus Project license. However, in regards to the minimum flow system malfunction, the Commission also requested:

> *"Once you identify the cause(s) of the system malfunction and rectify the problem, you will update the Commission with the results of any additional corrective measures".*

On December 28, 2015, GLHA notified the Commission (by voice mail to Mr. Raymond James) that the issues with the minimum flow system malfunction had been fully rectified and verified through testing. As a result, the open sluice gate at Ripogenus Dam was shut on December 22. In his December 31 reply, Mr. James requested that GLHA submit a written verification e-filing to the Commission that the McKay Station minimum flow system malfunction issues have been addressed.

Following the investigation of the minimum flow system malfunction, GLHA undertook several corrective measures:

1. All of the minimum flow brake pads on Units 1 & 2 at McKay Station were replaced, and the brake system components on all three generating units were cleaned and lubricated.

2. Limit switches on Units 1 and 2, which were found to intermittently malfunction, were adjusted.

Brookfield

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New England Regional Operations Center
Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, Maine 04462

Tel 207.723.4341
Fax 207.723.3948
www.brookfieldrenewable.com

3. Several air leaks in the minimum flow system were sealed.

4. A consultant was retained to verify that all PLCs (Programmable Logic Controllers) were correctly set up to ensure that the minimum flow system operates as intended.

5. Air pressures to the minimum flow system were adjusted to the correct operating pressures.

6. A preventative maintenance sheet was developed for annual minimum flow system testing and verification.

On December 22, 2015, following these corrective measures, the minimum flow system was thoroughly tested during a mock station outage, and it performed properly and as intended. Units 1 & 2 held at 13% wicket gate opening and Unit 3 held at a 7% opening during the outage (as intended with the minimum flow braking system), which provided a flow of ~390 cfs through the turbines. This flow, together with the 12 cfs estimated leakage flow from Ripogenus Dam, resulted in a flow of just over 400 cfs from the Project.

Following this testing and verification that the minimum flow system works properly, the sluice gate was closed later in the day on December 22, 2015.

Please feel free to contact me at (207-723-4341, x118) if you have any questions or comments.

Sincerely,

Kevin Bernier

Kevin Bernier
Senior Compliance Specialist

cc: A. Zarrella, K. Maloney, J. Seyfried, K. Murphy, M. Osborne, T. Mapletoft, J. Cole, M. Craig, M. Stanley, J. Clere, T. Wynn; GLHA
K. Howatt; MDEP
S. Shepard, A. Bentivoglio; F&WS
D. Kane, J. Perry, T. Obrey; MDIFW

GLHA File: 2572/1

# Attachment E

January 5, 2022

Ms. Kimberly D. Bose
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Via online submission to: http://www/ferc.gov (cross-filed)**

Subject: **Maine Council of Trout Unlimited Amplifying Report for Observed Low Flow Events for the Ripogenus Project (P-2572)**

Dear Secretary Bose:

On behalf of its six chapters and over 2,000 members, Maine Council of Trout Unlimited (TU) submits this report in amplification of the report of low flow events for the Ripogenus Project (P-2572) that TU filed on September 21, 2021.

**Background**

On August 30, 2021, an apparent flow excursion was witnessed below Ripogenus Dam by Chewonki Campground staff who informed TU of the event and provided photos. Such events have been occurring for the last ten years or more, but seem to be on the increase of late. The operator has generally reported them within ten days of their occurrence and we expected that to be case in this instance, but that did not occur. On September 13, TU called the FERC hotline and spoke with FERC official Mark Carter who explained that he would pass the information to appropriate FERC staff and that someone would be in contact with us. Hearing nothing back, we called again on September 15, and received the same assurance. On September 16, we were contacted by FERC official Alicia Burtner.[1] She explained how to report the event using FERC Online. Later that day, Chewonki Campground staff reported witnessing another low flow event. Rather than file a report of a separate event TU filed the report of the September 16 event with our report of the August 30 event.

To complicate matters, subsequent to the drafting of that report, Brookfield reported an excursion event that occurred on September 10, 2021.[2] It does not correlate with either of the flow events contained in our September 21, 2021 report. The Commission subsequently ruled that the September 10 flow event did constitute a license violation.[3]

Miles Puleio, who fishes and kayaks on the West Branch of the Penobscot River, participated in the proposed Study Plan Teleconference for the Ripogenus and Penobscot Mills project relicensings held on December 16, 2021.[4] Topics discussed included the study plan request submitted by TU for a Ripogenus

[1] Phone conversation, Stephen Heinz of TU and Alicia Burtner of FERC staff, September 16, 2021.

[2] Brookfield letter Subject: Ripogenus Project (FERC No. 2572); Whitewater Recreation Minimum Flow Excursion dated September 20, 2021, FERC Accession number 20210920-5168.

[3] FERC letter of November 8, 2021, Subject: Violation of Whitewater Recreation Flow – Article 402.
*"… at the Ripogenus Hydroelectric Project No. 2572, located on the West Branch Penobscot River in Piscataquis County, Maine. For reasons discussed below, we find you in violation of Article 402 of your project license."*

[4] Brookfield letter of December 8, 2021, Subject: Ripogenus Hydroelectric Project (FERC No. 2572-133) Penobscot Mills Hydroelectric Project (FERC No. 2458-247) Proposed Study Plan Meeting Agenda

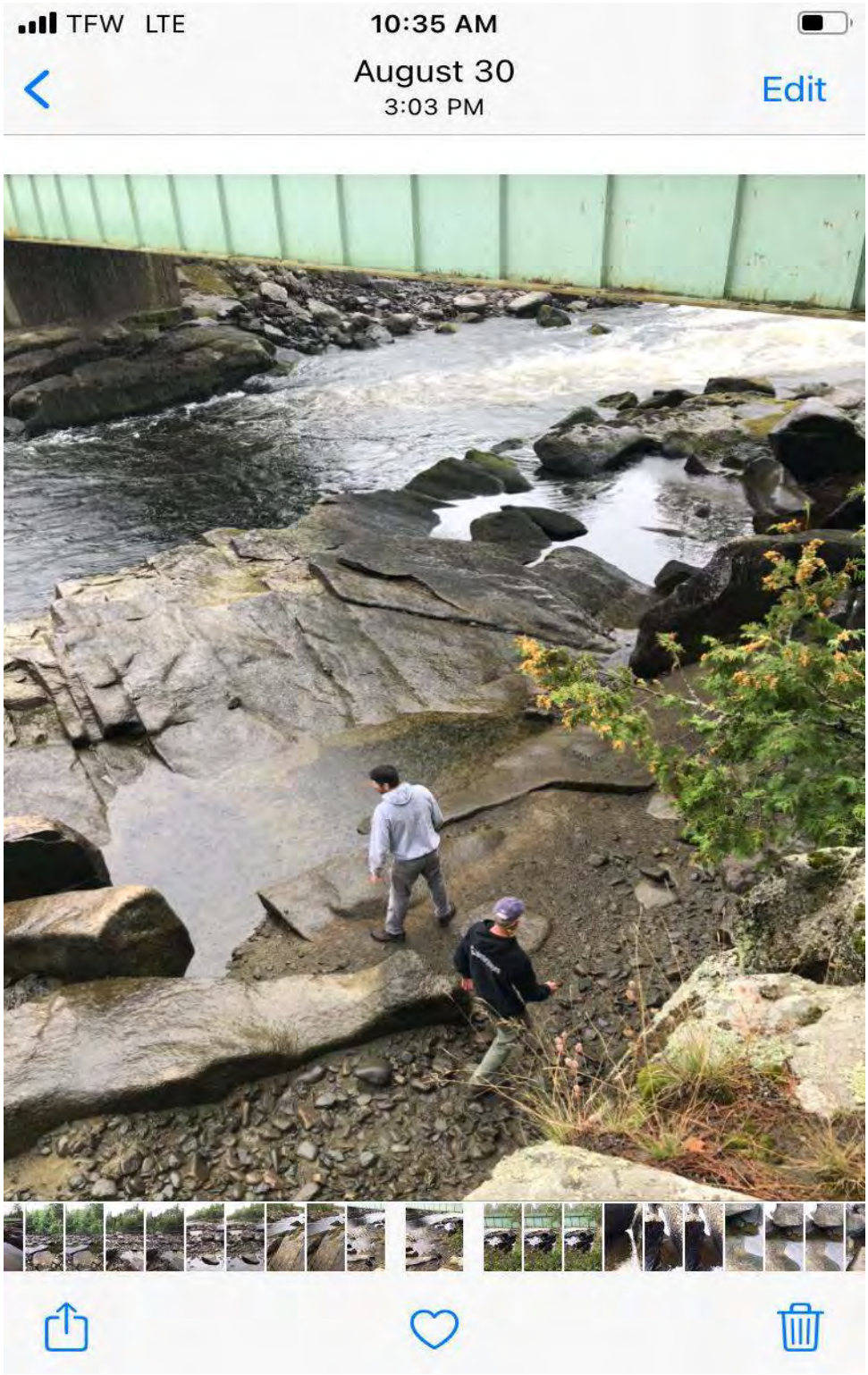
Flow Excursion Study that would conduct a planned low flow event with observers positioned downstream of McKay Station to see if strandings occurred. Miles contacted TU to say that he had a fish stranding photo taken during the August 30 event and macro-invertebrate stranding photos for the September 16 event. He also reported an additional low flow event that occurred on September 7, 2021 that we will address later in this document.

**Strandings Photos**

The photographs below were taken by Miles on the north bank of the West Branch of the Penobscot River immediately below Telos Bridge on August 30, 2021. He has verified that the date/time markings are correct. This map shows the exact location where the photos were taken:




The photo that follows on the next page was taken by Miles looking down at the river from the bank above and includes fellow kayakers Riley Adams and Bill Dallam.




Subsequent photos are of the pool to their immediate left. Please note that the place where they are pictured standing had been running at whitewater flows prior to the event that cause that reach to be classified as Class 5 whitewater. Rapid drops in water level have are likely to strand fish. Miles kayaked to check for other stranded fish and observed about 8 - 12 other stranded fish during this event with four fish specifically noted in a pool just above Holbrook. It is difficult to see stranded in pools, more difficult to photograph them.

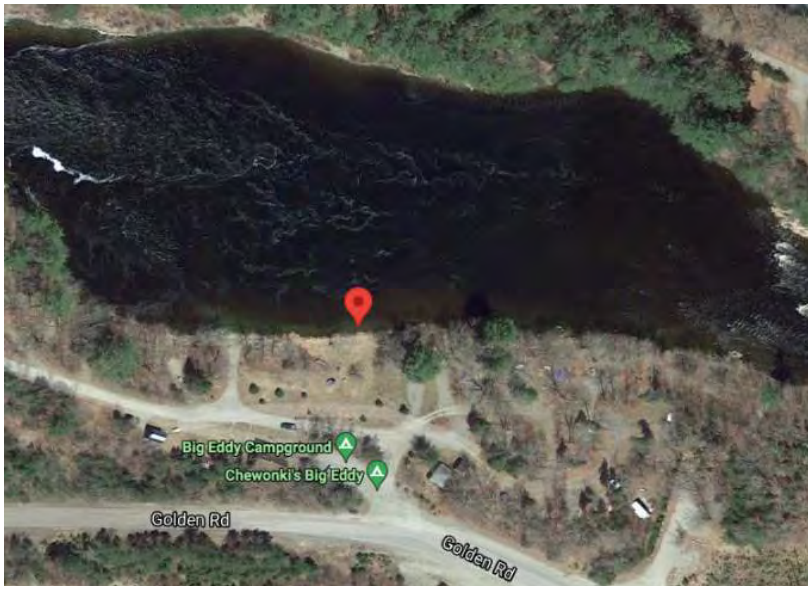
Here is a photo of the pool, it is difficult to see the stranded fish that it contains.



Here is the stranded fish. It is a landlocked salmon estimated at 12-13” in length. It was likely stranded in the pool for about three hours.



Here is are the map location and photos of a stranded macro-invertebrates taken during the September 16 event as video that may be viewed at https://drive.google.com/file/d/1KNQf-OzvoG2Lcrq_F2rdDitD3JyHB2I5/view?usp=sharing Numerous other stranded macro-invertebrates were also observed in the vicinity of the campground.









**Additional Low Flow Event**

Miles also reports that a previously unreported low flow event occurred on September 7. This flow was lower than evening flows had been and is estimated to be 800 cfs or less. This occurred at about 6:30 p.m. and persisted for about an hour. The photo that follows the map was taken looking downstream from where Holbrook joins the West Branch on the south bank. The location where the photo was taken is depicted on this map:






The following summary of incidents is provided for clarity:

- August 30 - reported by Maine TU Council filing dated September 21, 2021
- September 7 - previously unreported event (photo immediately above)
- September 10 - reported by Brookfield, ruled a license violation by FERC
- September 16 - reported by Maine TU Council filing dated September 21, 2021

**Ongoing FERC Action**

The photos provided afford additional verification of the August 30 and September 16 events and documents both fish and macro-invertebrate strandings. FERC established a sub-docket for these incidents: P-2572-134. It is assumed that the Commission is continuing to investigate the low flow events of August 30 and September 16, 2021; we assume that the information contained in FERC's filing of December 29, 2021 (bold supplied) will be considered when it rules whether these events constitute license violations as well:

"*Docket(s): P-2572-000*
*Filing Type: Part 12 Consultant Safety Inspection Reports*
*Description: Brookfield Renewable submits 11th Part 12D Independent Consultant's Safety Inspection Report and associated* ***Potential Failure Mode Analysis Addendum for the Ripogenus Project*** *under P-2572. "*

This casts doubt into our minds as to if the corrective actions Brookfield took in 2015[5] to prevent flows below 400 cfs that we noted in our initial report were fully effective.

**Additional Considerations**

FERC Project Officer commented during the PSP teleconference previously referenced that TU's proposed Ripogenus Flow Excursion Study should not be conducted until it the frequency of such events were determined. Apparently, there were at least four events that occurred in a three-week period during August and September of 2021. This amplifying report documents that strandings did occur incident to the August 30, 2021 event and September 16, 2021 event. This report confirms that low flows associated with generator shut downs cause stranding events lasting for over an hour at the least due to travel time for maintenance crews from Millinocket to McKay Station, and were of a longer duration in these specific incidences. We hope that the operator will take the consequences of these events to aquatic organisms into consideration and include the requested Ripogenus Flow Excursion Study in its Revised Study Plan. While these events are not of the magnitude of dewatering of the Upper Madison River in Montana due to a dam gate malfunction,[6] these events have been occurring for some time and studies to determine the magnitude of their impacts below Ripogenus Dam are long overdue.

**Conclusions and Request**

Maine TU Council appreciates the Commission's continuing attention to the low flow events below Ripogenus Dam.

We request a copy of the Brookfield Renewable 11th Part 12D Independent Consultant's Safety Inspection Report and associated Potential Failure Mode Analysis Addendum for the Ripogenus Project under P-2572, Accession Number 20211229-5198, especially the addendum.

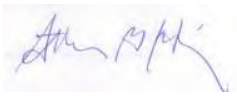
We believe that this filing bears on the study requests for the relicensing of the Ripogenus Project and have cross-filed this letter to docket P-2572-133.

---

[5] Brookfield letter dated January 7, 2016, RE: Ripogenus Project 2572, Article 402 Compliance; Follow-up to June 13, 2015 Flow Excursion due to McKay Station Outage

[6] Montana Free Press, Dam malfunction leaves upper Madison River trout high and dry, August 1, 2021. Accessed at - https://montanafreepress.org/2021/12/01/dam-malfunction-halves-madison-river-flow/

Sincerely and respectfully,



Stephen G. Heinz
Maine TU Council FERC Coordinator

Additional distribution:

FERC Docket P-2572-133
E-mail Courtesy Copies: Mark Carter, Sarah Sindo, Alicia Burtner, Miles Puleio, Ed Spear

# Attachment F

**From:** **Stephen Heinz** heinz@maine.rr.com
**Subject:** Ripogenus Strandings
**Date:** March 28, 2022 at 4:29 PM
**To:** kelly.maloney kelly.maloney@brookfieldrenewable.com, Randy Dorman Randy.Dorman@brookfieldrenewable.com
**Cc:** Julianne Rosset julianne_rosset@fws.gov, Kyle Olcott Kyle.Olcott@maine.gov, John Perry john.perry@maine.gov
**Bcc:** Matt Streeter mstreeter212@gmail.com, Jeffrey Reardon Jeffrey.Reardon@tu.org

SH

Dear Ms. Maloney and Mr. Dorman,

The attached FERC correspondence encouraged Brookfield to:

> work with Trout Unlimited, the resource agencies, and Commission staff to develop a proposal to address strandings and include it in the final license application you file by September 30, 2024.

We had expected this to be addressed in the Ripogenus - Penobscot Mills Revised Study Plan (RSP) that Brookfield recently published. Although the TU report of strandings that the attached FERC letter addresses appears in the RSP as part of Appendix Q beginning on page 315, we do not see strandings addressed by any of the studies proposed in the RSP.

We have not heard from you concerning this issue and ask that you schedule and conduct a teleconference to discuss this by Tuesday, April 5 - before the RSP Comment due date of April 7, 2022.

Thank you for your attention to this matter.

Sincerely,

Stephen G. Heinz
Maine TU Council FERC Coordinator
207 781-4762

PDF

20220301-3019
_P-257...3-1.pdf

> **From:** Alicia Burtner
> **Sent:** Wednesday, March 2, 2022 11:41 AM
> **To:** Stephen Heinz <heinz@maine.rr.com>
> **Cc:** Jeffrey Reardon <Jeffrey.Reardon@tu.org>; Sarah Sindo <ssindo@chewonki.org>
> **Subject:** RE: Allegation of Minimum Flow DeviaKons
>
> Hi Stephen,
>
> The leQer responding to the Trout Unlimited went out yesterday aS ernoon and can be downloaded here:
> hQps://elibrary.ferc.gov/eLibrary/filedownload?fileid=FBE0365C-0E9A-C216-960D-7F45FD700000
>
> I'll be out of the office today, but let me know if you have any quesKons.
>
> Thanks,
>
> **Alicia Burtner**
> *Fish Biologist*
> *Federal Energy Regulatory Commission*
> *Office of Energy Projects*
> *Division of Hydropower Administration and Compliance*

# Attachment G

**From:** **Dorman, Randy** Randy.Dorman@brookfieldrenewable.com
**Subject:** RE: Ripogenus Strandings
**Date:** March 31, 2022 at 9:38 AM
**To:** Stephen Heinz heinz@maine.rr.com

RD

Steve,

Thanks for reaching out. As you note, we did not propose a standing study as part of the Revised Study Plan (RSP), filed March 23, 2022. I apologize that our response to your study request is a bit hard to find in the RSP, but it's addressed on page 30 of Appendix R ("Comment and Response Matrix") of the RSP, which then refers back to Section 5.5, "Ramping Study to Determine Appropriate Rate of Flow Change below McKay StaNon."

Our rationale for not adopting the stranding study is the same as the ramping study: we believe that information collected and reported from other proposed studies, such as the Historical Operations Data Assessment Study, will provide information on how the Ripogenus Project has been operated, including flows provided by McKay StaNon.

Thanks again, and we look forward to reading TU's comments on the RSP.

Best,

Randy

**Randall Dorman**
*Licensing Manager*

150 Main Street, Lewiston, ME 04240
**T** 207.755.5605
C 207.402.0481
randy.dorman@brookfieldrenewable.com
www.brookfieldrenewable.com

Brookfield
Renewable U.S.

View Important disclosures and information about our e-mail policies **here**.

# Attachment H

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426
July 27, 2017
OFFICE OF ENERGY PROJECTS

Project No. 9690-112–New York
Rio Hydroelectric Project
Eagle Creek Hydro, LLC

Project No. 10481-067–New York
Mongaup Falls Hydroelectric Project
Eagle Creek Hydro, LLC

Project No. 10482-117–New York
Swinging Bridge Hydroelectric Project
Eagle Creek Hydro, LLC

Mr. Robert Gates
EVP Operations
Eagle Creek Renewable Energy, LLC
116 North State Street
PO Box 167
Neshkoro, WI 54960-0167

**Reference: Request for Studies and Additional Information**

Dear Mr. Gates:

After reviewing the Mongaup River Project's Pre-Application Document (PAD), the transcripts of the scoping meetings held June 22, 2017, and participating in a project environmental site review on June 21, 2017, we have determined that additional information is needed to adequately assess potential project effects on environmental resources. We have 11 study requests (enclosed in Schedule A) for aquatic, fisheries, terrestrial, recreational, and cultural resources. We also have additional information needs (enclosed in Schedule B). Please provide the requested additional information in your proposed study plan, which must be filed by September 12, 2017.

Please include in your proposed study plan a master schedule that includes the estimated start and completion date of all field studies, when progress reports will be filed, who will receive the reports and in what format, and the filing date of the initial study report. All studies, including fieldwork, should be initiated and completed during the first study season (unless a second study season is necessary), and the study reports should be filed as a complete package. If, based on the study results, you are likely to

propose any plans for measures to address project effects, drafts of those plans should be filed with your Preliminary Licensing Proposal (or draft license application).

Please note that we may request additional studies or information at a later time, including upon receipt and review of scoping comments/study requests, due July 29, 2017, and your proposed study plan.

If you have any questions, please contact Quinn Emmering at (202) 502-6382, or via e-mail at quinn.emmering@ferc.gov.

Sincerely,

Timothy Konnert, Chief
West Branch
Division of Hydropower Licensing

Enclosures: Schedule A – Study Requests
Schedule B – Additional Information

cc: Mailing List
Public Files

## Schedule A

## Study Requests

After reviewing the information in the Pre-Application Document (PAD), we have identified information that is needed to assess project effects. As required by section 5.9 of the Commission's regulations, we have addressed the seven study request criteria in the study requests that follow.

### Study Request #1 – Reservoir Water Level Fluctuation / Operations Model

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to develop an operations model that may be used to predict reservoir elevations for each of the Mongaup River project reservoirs under various operation constraints (e.g., minimum flow, reservoir level, etc.). The operations model should support an assessment of potential project effects on aquatic, terrestrial, recreation and land use, and aesthetic resources that may result from proposed or recommended project operational scenarios. Specifically, for each project reservoir, the model should be able use historic inflows to predict reservoir outflow, reservoir elevations and surface areas, and corresponding project generation at an appropriate time-step.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

The Federal Energy Regulatory Commission (Commission) must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Project operations affect reservoir elevations on a seasonal, weekly, daily, and potentially hourly basis. Therefore, project operations may affect several environmental resources. Understanding the effect of proposed and recommended project operations on generation and reservoir water levels, storage, and surface area, is essential to understand how the Mongaup River projects' operation affects these resources and, therefore, relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

The PAD provided general information about the magnitude of the licensed limits for water level fluctuation in the projects reservoirs and provided information on the hydrology of the Mongaup River, and hydraulic capacities of the projects and the proposed operations.

While this information is available, it is insufficient to fully inform an analysis of how proposed and potential project operations may affect generation and the environmental resources discussed above.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

Project operations have the potential to affect reservoir elevations for each of the five reservoirs associated with the Mongaup River projects on a seasonal, weekly, daily, and even hourly basis. The requested operations model should provide information on reservoir water surface area, elevations, and fluctuation rates and support an assessment of potential project effects on aquatic, terrestrial, recreation and land use, and aesthetic resources associated with the reservoirs and that may result from proposed and/or recommended project operational scenarios. This information will inform the development of potential license conditions that consider the non-developmental values of the project, as well as their power and developmental values.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data*

*collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

Eagle Creek should develop, calibrate, and validate an operations model that integrates each of the three Mongaup River projects and supports the evaluation of proposed and potential recommendations for the project operations, at an hourly (or better) time-step and under various reservoir inflow and outflow conditions. The operations model should be capable of predicting reservoir elevations, surface areas, available storage, and generation that would result from various operational scenarios.

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of the study is approximately $150,000. Eagle Creek did not propose an alternative study.

**Study Request #2 – Aquatic Habitat Mapping of the Projects' Reservoirs**

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to map the aquatic habitat within each of the five reservoirs associated with the Mongaup River projects, evaluate the types of aquatic habitats that occur, and identify any potential effects project operations may have on this habitat.

Specifically, the objectives of the study are to:

1. Survey and map the aquatic habitat types distributed within the reservoirs, from the upper extent of each impoundment to the associated dam.

2. Describe the potential influences of the projects' operations on aquatic habitats within the impoundments.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Aquatic habitats in the projects' reservoirs support an aquatic ecosystem that provides public opportunities, including sport fisheries. This study would provide information needed to determine the effects of project operations on this resource relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

Upon review of Eagle Creek's PAD, we find aquatic habitat data for the projects' reservoirs to be very limited. Eagle Creek generally implies that there is a sufficient amount of existing information to support the licensing process, including information on the aquatic habitat resulting from study and/or monitoring in support of the current license. However, the PAD did not include sufficiently detailed information to allow us to determine if the information is adequate to support the Commission's licensing process. As such, additional aquatic habitat information, including the mapped locations of aquatic habitats within each of the projects' reservoirs is needed to evaluate the projects effects on aquatic resources.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

Currently, water levels in the projects' reservoirs fluctuate on a seasonal, weekly, daily, and even hourly basis due to the projects' load-following peaking operations. As a result, any aquatic habitat exposed under low water levels may be adversely affected and/or inhibit the utilization of aquatic habitats by aquatic species during various life stages. These events may also cause fish or other aquatic species (e.g., mussels and macroinvertebrates) stranding and associated mortality.

This requested study would help establish a baseline condition and the health of the aquatic habitat within the projects' reservoirs and assist in forming the basis for inclusion of potential license articles to protect the aquatic resources.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

Using generally accepted practices in the scientific community:

1. Conduct field surveys of aquatic habitat during full-pool from the head of each of the projects' reservoirs to the associated dam.

2. Categorize habitat survey information per accepted practices in the scientific community (e.g., habitat type, substrate type, depths, etc.) and plot on aerial maps. Also record in-situ water quality conditions (temperature, dissolved oxygen (DO), pH, conductivity) and the presence of invasive aquatic vegetation (species and location).

3. Prepare a report that includes a summary of the data collected. Include in the report, aerial habitat maps that demarcate proposed minimum and maximum reservoir elevations, habitat descriptions, project operations and reservoir elevations and surface areas during the surveys, effects of

proposed project operations on the aquatic habitat(s), and in-situ water quality data. Include all data used to develop the report in an appendix.

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of this work is approximately $100,000 and may be completed within one study season. It is anticipated that two technicians and a biologist would spend about 40 hours in each reservoir to conduct field work. Report preparation would require about a month of a biologist's and/or GIS specialist's time to complete.

We recognize, however, that if more detailed information exists on aquatic habitat in the project reservoirs than what was provided in the PAD, and we determine it to be sufficient to inform our environmental analysis, this requested study should not be necessary.

**Study Request #3 – Baseline Fisheries Population Study**

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to gather baseline fisheries data throughout the projects' area. These data are needed to identify the fish species that occur in the projects' impoundments, tailwaters, downstream riverine corridors, and bypassed reaches as well as to evaluate any potential project effects. Specifically, the objectives of the study are to:

1. Determine the relative abundance and distribution of fish species within the project impoundments, tailwaters, riverine corridors, and bypass reaches within the projects' area.

2. Describe the distribution of fish species within the aquatic habitats and compare and contrast current data with historic survey data.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Fish populations in the Mongaup River support a sport fishery. The effect of project operation on this resource is relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information.*

A review of the PAD, revealed that the New York State Department of Environmental Conservation (NYSDEC) conducted surveys of fish populations for portions of the project area prior to 1980 and in 1987 the prior licensee conducted fish surveys in support of its license application. While this information is existing, project operations, particularly minimum instream flow requirements, were changed when the current license was issued and it appears that no new fisheries data has been collected since those project operational changes occurred, as a result, fisheries population data are needed to evaluate the projects' effects on this resource.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

Potential project effects on fishery resources may include fish entrainment through the generating units, minimum instream flows, and peaking flow operations. Information on the abundance and distribution of the existing fish community would help to identify whether adverse effects are occurring and/or determine whether the current license conditions are protective of the resource as intended.

The applicant is proposing to continue providing the existing minimum flows. Flow releases from the projects have the potential to affect the suitability of aquatic habitat in these reaches, and in turn fishery resources. This requested study would help establish the current baseline condition on the health of the fishery in the projects' area of the Mongaup River basin under the current projects' operation. These data would also assist in informing potential license articles to protect fishery resources in the Mongaup River.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

Using generally accepted practices in the scientific community:

1. Conduct electrofishing surveys in each of the project impoundments, tailwaters, and downstream riverine corridors, including boat or backpack electrofishing within the bypassed reaches. Conduct sampling during late-summer or fall in order to observe annual juvenile production (juvenile fish would be large enough to collect). Establish sampling locations that represent the full extent and types of habitat in the study area.

2. Separately target upstream and downstream migrating American eels for sampling using generally accepted methods, such as electrofishing, trap/fyke netting, eel pots, etc. to provide data on the abundance of

American eels at various life stages, and where they tend to congregate. Conduct the study in late spring/early summer to target upstream migrating juvenile eels (i.e., elvers and yellow eels), and during the fall to target downstream migrating adults eels (i.e. silver eels).

3. Identify to species and count all collected fish while weighing and measuring only a subsample. Measure eye diameters of captured American eels for use in the evaluating silver eels phase. Identify and record the habitat type and substrate of each sampling location, and record in-situ water quality conditions (temperature, DO, pH, conductivity).

4. Prepare a report that includes a summary of the data from the above studies. Include tabular summaries of fish species collected by station, plus data on lengths, weights, condition factors, and in-situ habitat conditions. Also include specific information relating to American eel population characteristics, such as areas at the base of the dams where elvers congregate, and the abundance of potential downstream migrating silver eels. Include all data used to develop the report (including date and time of collection) within an appendix to the report.

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of this work is approximately $100,000 and may be completed within one study season. It is anticipated that three technicians and a biologist would spend about 160 hours conducting field work for each project. Report preparation would require about 60 hours by a biologist. Eagle Creek did not propose an alternative study.

**Study Request #4 – Stream Reach Water Quality Study**

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to monitor and evaluate water quality within area streams affected by project operations to support an evaluation of the existing minimum instream flow requirements to meet state water quality standards.

Specifically, the study objective is to monitor water quality (e.g., dissolved Oxygen and temperature) on area stream reaches where current water quality data is limited or non-existent.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Water quality in project affected reaches of area streams support an aquatic ecosystem that provides public opportunities, including sport fisheries. Ensuring that the effect of project operations pertaining to this resource is considered in a reasoned way is relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

Pursuant to its existing license, Eagle Creek has monitored summer and fall dissolved Oxygen and water temperature downstream of the Swinging Bridge, Mongaup Falls, and Rio Powerhouses since 2011 and the PAD summarizes these monitoring results. In addition, a U.S. Geological Survey (USGS) gage station (Station No.

01433500) has collected water quality data immediately downstream of the Rio Project's tailrace on the Mongaup River since October 1, 2013. However, there are several reaches of area streams that are affected by project operations where water quality monitoring does not appear to have been conducted and no water quality data has been presented. These reaches include:

- Black Lake Creek between Toronto Reservoir and Cliff Lake,
- Black Lake Creek between Cliff Lake Reservoir and its confluence with the Mongaup River,
- the Mongaup River between the Swinging Bridge Powerhouse No. 2 and the Mongaup Falls Project reservoir,[1]
- the Mongaup Falls Project's bypassed reach on the Mongaup River, and
- the Rio Project's bypassed reach on the Mongaup River.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

The existing license requires Eagle Creek to release minimum flows from the project's reservoirs to the five area stream reaches mentioned above. The presence of upstream project reservoirs and the projects' operations alter the stream flow which subsequently affects water quality.

This requested study would help establish the baseline water quality condition within these five affected area stream reaches and aid in determining the adequacy of the minimum instream flow release for protecting water quality and assist in forming the basis for inclusion of potential license articles to protect water quality and aquatic resources therein.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally*

[1] We recognize that Eagle Creek monitors the water quality 0.3 miles downstream of the Swinging Bridge Powerhouse No. 2 tailrace.

*accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

1. Using generally accepted practices in the scientific community monitor water quality (DO and water temperature) from June 1 through September 30 on a fifteen minute interval at the following locations:

    - Black Lake Creek at the discharge of the Toronto Reservoir,
    - Immediately upstream of the mouth of Black Lake Creek at Cliff Lake,
    - Black Lake Creek at the discharge of Cliff Lake,
    - Black Lake Creek immediately upstream of its confluence with the Mongaup River,
    - Mongaup River immediately upstream of the Mongaup Falls Project reservoir,
    - Mongaup River immediately downstream of the Mongaup Falls Project's minimum flow outlet structure discharge (upper extent of the bypass reach),
    - Mongaup River immediately upstream of the Mongaup Falls tailrace (lower extent of the bypassed reach),
    - Mongaup River immediately downstream of the Rio minimum flow powerhouse (upper extent of the bypassed reach), and
    - Mongaup River immediately upstream of the Rio Project's tailrace (lower extent of the bypassed reach).

2. Document and record stream flows within each project affected stream reach during the study period on the same 15 minute interval that water quality data is collected.

3. Record ambient air temperature at each water quality monitoring location during the study period.

4. Prepare a comprehensive water quality study report for each of the projects' affected stream reaches that incorporates all existing water quality data collected pursuant to the current license and USGS gage Station No. 01433500, the new water quality data collected pursuant to this study request, and consider the influence of ambient air temperature and stream flows on water quality within the project affected stream reaches.

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of this work is approximately $40,000 and may be completed within one study season. It is anticipated that it will take two technicians, eight days to deploy and retrieve the monitoring equipment (including travel and staging) and about 80 to 100 hours for oversight and report preparation by a senior biologist.

**Study Request #5 – Reservoir Water Quality Study**

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goals and objectives of this study are to monitor baseline water quality conditions within the projects' reservoirs to support an evaluation of the existing condition and potential effects on aquatic habitats within project reservoirs and determine if reservoir water quality meets state water quality standards.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Water quality in the projects' reservoirs support aquatic habitats and public recreational opportunities, such as swimming, boating, and fishing. Therefore, evaluating the effect of the projects' operations on reservoir water quality is relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

The PAD provide very little information about the water quality within the projects' reservoirs. Swinging Bridge Reservoir was assessed and included in the NYSDEC 2002 *Water Body Inventory / Priority Waterbodies List* (NYSDEC 2002) as an impaired water body.[2] That assessment noted that hydrologic impacts associated with hydropower generation may have been an issue affecting the reservoir's water quality and influenced its inclusion on the list. However, Swinging Bridge Reservoir was not included NYSDEC's proposed final Section 303(d) list in 2016 (NYSDEC 2016). The PAD also acknowledges that during the summer, the hypolimnion in Toronto and Swinging Bridge reservoirs, become anoxic; however, the source of this information appears to be limited and possibly anecdotal. Similarly, the PAD notes that Rio reservoirs hypolimnion becomes anoxic when thermally stratified and cites Orange and Rockland Utilities 1988 license application for the project (Orange and Rockland 1998). The PAD also notes that the Mongaup Falls reservoir hypolimnion does remain oxygenated during the summer months and contributes this to project operations and subsequent turbulence within the reservoir that disrupt the development of a thermocline; however, no citation or supporting data is provided in the PAD.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

Water quality in the projects' reservoirs may affect aquatic habitats and influence public recreation opportunities within the reservoirs. As mentioned above and demonstrated in the Mongaup Falls reservoir, project operational regimes can influence

[2] Toronto, Cliff Lake, Mongaup Falls, and Rio reservoirs were not assessed in the 2002 inventory.

the water quality within a reservoir. Additionally, water discharged from project reservoirs may affect aquatic habitats and biota within the receiving stream reaches. Understanding the existing water quality conditions within the projects' reservoirs is necessary to inform the need for, and the development of, potential license conditions to protect water quality within the reservoirs and downstream riverine reaches for aquatic habitats and biota and recreational opportunities.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

1. Using generally accepted practices in the scientific community monitor water quality (e.g., water temperature and DO) within each of the projects' reservoirs from ice-off in the spring until ice-on in the winter. Water quality data must be monitored at appropriate locations within each reservoir and at 1-meter increments in depth from the reservoir surface to its bottom. An additional monitoring location must be established at the project intakes (depth and location) within each reservoirs. Data collected should be sufficiently robust to evaluate and consider what, if any, short- and/or long-term (seasonal) influences project operations may have on reservoir water quality (e.g., thermocline depth, water temperature, etc.).

2. Prepare a comprehensive water quality study report for each of the projects' reservoirs that incorporates the water quality data collected pursuant to this study request and as appropriate, the in-situ water quality data collected pursuant to the aquatic habitat mapping study discussed above.

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of this work is approximately $110,000 and may be completed within one study season. It is anticipated that it will take two technicians, 28 days to

deploy, maintain, and retrieve the monitoring equipment (including travel and staging) and about 80-100 hours for oversight and report preparation by a senior biologist.

**Study Request #6 – Special-status Wildlife Species and Habitat Assessment**

Goals and Objectives

§5.9 (b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to develop additional information to supplement the existing information necessary to address the potential effects of project operations and maintenance (O&M), land management activities, and recreation use on the presence of special-status wildlife species[3] and their habitat. The specific information to be obtained is the type, abundance, and general distribution of special-status wildlife species and their habitat within the project area, required to assess the potential effects of the project on these species.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

[3] Special-status wildlife species include federally listed threatened and endangered species, proposed species, candidate species, and species of concern; state protected species; and species of conservation concern.

Special-status species are of particular interest because of their rarity and ecological functions. Ensuring that environmental measures pertaining to these resources are considered in a reasoned way is relevant to the Commission's public interest determination. Additionally, this information may be needed to ensure compliance with the Endangered Species Act.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information.*

Special-status wildlife species, such as federally listed northern long-eared bat, Indiana bat, and bog turtle as well as several state-listed species are identified in the PAD as potentially occurring in the project area. NYSDEC has indicated that bald eagles use all five reservoirs associated with the projects in the winter, but no information was provided regarding potential breeding pairs using the projects. NYSDEC also indicated that state-listed peregrine falcon nests and timber rattlesnake are found in the project area. NYSDEC conducted surveys for the New York State Breeding Bird Atlas from 2000 to 2005 which provided a list of potential bird species in the project area including species of conservation concern such as the wood thrush, Canada warbler, and bobolink. There are, however, no comprehensive surveys to identify the abundance, timing, activities, and general distribution of special-status wildlife species or their habitats within the project area.

This information will inform the development of potential license conditions that consider the non-developmental values of the project, as well as their power and developmental values. Additionally, this information may be needed to ensure compliance with the Endangered Species Act.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

Project O&M as well as recreation use associated with the project, have the potential to affect special-status wildlife species and their habitat in the project area. This study will assist in identifying special-status wildlife species within the project area and the need for measures to reduce or eliminate effects.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

Office Review

Prior to field surveys, the candidate list of special-status wildlife species should be confirmed and developed in consultation with the U.S. Fish and Wildlife Service (FWS) and NYSDEC and include all special-status species currently identified in the PAD. Consultation with resource agencies should also determine recommended survey protocols for each species. Habitat maps and/or aerial photographs should be used to determine habitats that have the potential to support special-status wildlife species for field surveys.

Field Surveys

Field surveys for special-status wildlife in appropriate habitats should be conducted by individuals with experience conducting wildlife field surveys; knowledge of animal taxonomy and animal ecology and classification; familiarity with the wildlife of the area; and experience with analyzing impacts of a project on native wildlife species.

Field surveys should cover the entire area directly and indirectly affected by the project during the appropriate seasons. Multiple surveys should be conducted to locate all potential special-status wildlife species and should also assess seasonal habitat use when relevant (e.g. bat maternity sites and winter hibernacula). Survey protocols should follow accepted and agency recommended wildlife species survey guidelines and protocols.[4] Some project features may also provide suitable roosting and hibernating habitat for special-status bat species and therefore should also be surveyed. The abundance, distribution, and habitat use (including raptor nest sites) of all special-status species should be documented and the locations of all special-status species and their potential habitat should be indicated on maps showing the relationship to project features.

A report should be prepared that includes the results (including photo documentation) of the surveys and mapping efforts and identifies, describes, and assesses

[4] Available through the FWS's IPaC system at https://ecos.fws.gov/ipac/.

the extent to which project-related actions and activities may affect special-status wildlife species and their habitat. The report will include the issues addressed, objectives, study area, methods, analysis, results, discussion, and conclusions. The report should also include documentation of consultation with relevant resource agencies.

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of this work is approximately $180,000, based on one study season and the amount of habitat that has the potential to support special-status wildlife species. It's anticipated that a technician and a biologist would spend one week of desktop review and planning in preparation for field work. One biologist and two technicians would spend about 300 hours conducting field work. Report preparation is estimated at six weeks of a biologist's and technician's time to complete.

**Study Request #7 – Special-status Plant Species and Noxious Weed Assessment**

Goals and Objectives

§5.9 (b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to develop additional information to supplement the existing information necessary to address the potential effects of project O&M and recreation use on the presence of special-status plant species[5] and the presence and potential spread of noxious terrestrial and aquatic weed species.[6] The specific information to be obtained is the type, abundance, and general distribution of special-status and terrestrial and aquatic noxious weed species within the project area, required to assess the potential effect of the project on these species.

[5] Special-status plant species include federally listed threatened and endangered species, proposed species, candidate species, and species of concern; state protected species; and watch list species.

[6] A noxious weed is any plant designated by a federal, state, or county government as injurious to public health, agriculture, recreation, wildlife, or property.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project, as well as power and developmental values. Any license issued shall be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Special-status species are of particular interest because of their rarity and/or ecological functions. Noxious weeds are resources of particular interest because of their potential effects on natural ecosystems. Noxious weeds can degrade wildlife habitats, crowd out beneficial native species, create fire hazards, and result in economic losses. Ensuring that environmental measures pertaining to these resources are considered in a reasoned way is relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information.*

Special-status plant species, such as the federally listed small whorled pogonia as well as state-listed species have been identified in the PAD as potentially occurring in the project area. NYSDEC indicated that state-listed riverbank quillwort, dwarf sand-cherry, and swamp buttercup also occur in the project area. Additionally, a list of potential terrestrial and aquatic noxious weed species was provided in the PAD, however no surveys for noxious weed species have ever been conducted.

Currently, there is very limited information concerning the rare plant and noxious weed species that may be present, their relative abundance, habitat associations, locations, information on the possible effects of project O&M activities and recreation

use on these populations as well as the potential effects of noxious weed species on native plant diversity and habitat quality.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

Project O&M as well as recreation use associated with the project, have the potential to destroy special-status plant species as well as introduce and spread noxious weeds in the project area. This study will assist in identifying special-status plants and noxious weeds within the project area and provide baseline information from which to evaluate project alternatives and/or develop and evaluate specific proposals for protection, mitigation, and enhancement of rare plant populations and their habitats and control of noxious weeds.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

Office Review

Prior to field surveys, the current list of special-status plants identified in the PAD should be confirmed and developed in consultation with FWS and NYSDEC. Field surveys should examine habitat maps and/or aerial photographs to determine vegetation cover types that have the potential to support special-status plant species.

Field Surveys

Field surveys for special-status plants of appropriate habitats should be conducted by individuals with experience conducting floristic field surveys; knowledge of plant taxonomy and plant community ecology and classification; familiarity with the plants of the area; and experience with analyzing impacts of a project on native plant species. Field surveys should be floristic and cover the entire area affected by the project during the appropriate blooming periods. Multiple surveys should be conducted to locate all

potential special-status species. Two study seasons should be performed to confirm the presence of rare, special-status plant species. The survey protocol will follow accepted special-status plant survey guidelines. The abundance and distribution of all special-status species should be documented and indicated on maps showing the relationship to proposed project features.

Aquatic[7] and noxious weed surveys should map noxious weed occurrence and distribution and be conducted in conjunction with the special-status plant surveys using generally accepted practices in the scientific community. All remaining aquatic habitats not covered in Study Request #2 should also be surveyed for aquatic noxious weed species. The surveys will serve to identify the current extent of weed infestations in a general sense throughout the project area, the species that occur, and the relative abundance of each species.

After completion of the field surveys, prepare a report that includes the results of the surveys and mapping efforts and identifies, describes, and assesses the extent to which project-related actions and activities may affect special-status plants and noxious weeds. The report should include the issues addressed, objectives, study area, methods, analysis, results, project-specific maps with known occurrences of special-status plants and noxious weed species, discussion, and conclusions.

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of this work is approximately $86,000, based on two study seasons and depending upon the amount of habitat that has the potential to support special-status species and noxious weed species. It's anticipated that a technician would spend one week of desktop review and planning in preparation for field work. One biologist and a single technician would spend about 100 hours conducting field work. Report preparation would require about two weeks of a biologist's and technician's time to complete.

[7] Aquatic weed species associated with lacustrine habitats are included in Study Request #2 – Aquatic Habitat Mapping of the Projects' Reservoirs.

**Study Request #8 – Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area Assessment**

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goals of the Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area Assessment are to: (1) obtain information about the condition of existing recreation facilities and access sites at the projects; and existing recreation use, access, and demand at the projects; (2) conduct an assessment of the need to enhance recreation opportunities and access at the projects; (3) quantify and map the relationship between reservoir surface area and reservoir levels; and (4) develop a Recreation Management Plan for the implementation of any enhancement measures and long-term monitoring of recreation demand and adequacy of facilities at the projects over the terms of new licenses.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Recreation has been identified as a project purpose by the Commission. Applicants are encouraged to develop recreation resources in such a matter that is "consistent with the needs of the area to the extent that such development is not inconsistent with the primary purpose of the project" (18 C.F.R. §2.7). Identifying

effects of project operations pertaining to this resource is relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

Section 5.8 of the PAD provides a summary of project-related recreation activities and recreation facilities. It also provides a general discussion of recreation demand in the region. However, the PAD provides no project-specific information regarding visitor perceptions of recreation at the projects, nor any information of how project operations may affect the visitor experience. Public recreation access and reservoir levels were two of the primary topics discussed by members of the public during the June 22, 2017, scoping meetings. Furthermore, there is an extensive record of a variety of conflicts associated with public recreation access at the projects. Information on visitor perceptions of the adequacy of public access and facilities, current use, and whether existing access facilities in the area are meeting recreation demand would inform future license conditions related to public access and recreation facilities. Information on reservoir surface area would inform our analysis of the impact of project operations on recreational opportunities at the projects.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

The projects include five reservoirs and one bypassed reach with recreational opportunities. An analysis of existing recreation use and access at the projects would help form the basis for determining the projects' ability to enhance public recreation opportunities. Also, an assessment of the current level of recreation use and how project operation may affect use would provide information necessary to develop a Recreation Management Plan for efficient management of the recreational components of the projects over the terms of new licenses.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule*

*including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

1. Update existing data on recreation resources adjacent to and within the projects through site assessment and consultation with public and private recreation providers.

2. Update the inventory of informal and formal public and private waterfront recreational sites/facilities within and adjacent to the project boundaries. Identify all informal and formal public and private recreational sites/facilities within the project areas.

3. Develop and implement a site condition evaluation criterion of measurable and manageable indicators for facilities and dispersed recreation area conditions. Site condition assessments should be conducted at all formal and informal publicly accessible recreation sites. Eagle Creek Hydro should also consult with the NYSDEC to evaluate the need of including other NYSDEC recreational developments that serve the projects into the site condition assessment.

4. The use and needs assessment should include all recreation activity types known to occur or potentially occurring at the projects. Specific methods should include visitor observations and on-site visitor intercept surveys at formal and informal public recreation areas at the project reservoirs and riverine areas, including the bypassed reach between the Rio Project minimum flow powerhouse tailrace and the main powerhouse tailrace.

5. Specific methods for each sampling approach in the use and needs assessment:

   - the visitor observations should capture information such as location, date, time, weather, number of vehicles, watercraft (if any), number of recreation users or party size, and recreation activity engaged in; and
   - the visitor survey sampling should be based on a stratified random sample that includes all seasons, various locations, and various times of week and day to enable representative responses from the visitors, while ensuring interview coverage during key times (e.g., holiday and weekend days, shoulder seasons, fishing and hunting seasons).

6. The survey instrument should include items that assess visitor perceptions of crowding, recreational conflict, conflicts between the public and adjacent property owner(s), welcoming public access, adequacy and placement of signage, adequacy of recreation facilities and access to the projects, and effects of project operations and management on recreation and recreation opportunities at the projects (e.g., fluctuating reservoir levels and minimum flow releases).

7. In conjunction with Study #10 requested below, consult with stakeholder groups to develop a whitewater boating-specific addendum to the survey instrument that would rate satisfaction with the current whitewater boating flow release schedule, access facilities, and boating information. The study report should include an assessment of opportunities to modify or enhance the current whitewater flow release schedule, boater access facilities, and/or boating information.

8. Annual recreation use by activity type and season should be quantified to include both formal and informal publicly accessible recreation sites.

9. The needs assessment should also include a future demand estimate from both current use and unmet demand based on guidance from Haas et al. (2007). Specifically, the following information should be integrated to provide an estimate of future recreation demand at the projects: (1) prior and current project use data; (2) state, regional, and national recreation trend data; and (3) population growth data.

10. Quantify the relationship between reservoir surface area and reservoir levels (i.e., reservoir elevation) for the range of operation (i.e., full pool to minimum reservoir level) at each project reservoir. This relationship should also be mapped to visually assess the effects of reservoir levels on reservoir surface area and identify specific areas that may become inaccessible at lower reservoir levels.

11. Identify potential measures to alleviate or reduce any negative effects of project operations, to enhance existing recreation opportunities, and (if appropriate) provide additional public access at the project reservoirs or riverine reaches (potential locations, type of facilities and access, and any associated costs).

12. Using the information from all recreation studies, develop a Recreation Management Plan for the projects. The plan should be included in the license application and should include, at a minimum: (1) description of any proposed protection, mitigation, and enhancement measures, including: location of any proposed facilities and/or access areas (including descriptions and figures depicting the relationship of any proposed facilities to the existing project boundaries), proposed ownership and management of any proposed facilities, associated capital, and O&M costs, and a timeline for implementation; (2) description of operation and management measures associated with project-related recreation access and facilities; and (3) an adaptive plan for future monitoring of recreation use, impacts, and adequacy of project-related facilities to meet demand over the term of the new license.

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of the Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area Assessment is $95,000, including study plan development, field data collection, reservoir surface area modeling and mapping, study report preparation, and development of the Recreation Management Plan. One field season should be sufficient to collect the required data and prepare the study report.

**Study Request #9 – Shoreline Management Assessment**

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goals of the Shoreline Management Assessment are to: (1) obtain information on the adequacy and appropriateness of current shoreline management practices, and (2) develop a Shoreline Management Plan in consultation with relevant stakeholders.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Recreation has been identified as a project purpose by the Commission. Applicants are encouraged to develop recreation resources in such a matter that is "consistent with the needs of the area to the extent that such development is not inconsistent with the primary purpose of the project" (18 C.F.R. §2.7). Identifying effects of project operations pertaining to this resource is relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

The PAD includes only limited information on shoreline management in Sections 5.8.5 and 5.8.9. We note that, although it did not include it in the PAD, Eagle Creek Hydro did file the current "shoreline management guidelines" with the Commission on June 5, 2015. During the June 22, 2017, scoping meetings, several shoreline property owners expressed concerns regarding shoreline management issues and reservoir levels. Additionally, there is an extensive record of complaints related to shoreline management

issues. Therefore, Commission staff needs information on current shoreline management practices in order to determine whether these practices are adequate and appropriate.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

The projects include five reservoirs. Currently, private residential and commercial developments are primarily located on the Toronto and Swinging Bridge reservoirs. Eagle Creek Hydro is directly responsible for shoreline management at the projects. Additionally, project operations directly impact reservoir levels, and reservoir levels affect shoreline management practices. An assessment of current shoreline management practices would provide the information necessary to develop a Shoreline Management Plan that would be implemented over the terms of any new licenses issued for the projects.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

1. Develop a questionnaire to solicit information from shoreline property owners at each project reservoir about their recreation activity participation, areas visited, perspectives about reservoir levels and current shoreline management practices, perceived conflicts and crowding, and their satisfaction with or desire for recreational opportunities and facilities.

2. The applicant should consult with representatives of the various shoreline property owners on the most effective means of distributing the questionnaire. Regardless of how the questionnaire is distributed (i.e., mail, email, or internet), the applicant should follow the Dillman (2014) tailored design method. This method would help ensure that property owners have ample opportunity to complete the survey and would help increase survey response rates. The applicant should also consult with interested stakeholders, including property owner representatives and the

NYSDEC, and Commission staff in the development of the questionnaire before it conducts the study.

3. Prepare a detailed report of the study results, and use these results in conjunction with the results of the other recreation studies to inform the development of a Shoreline Management Plan. Interested stakeholders should be given the opportunity to comment on the draft plan. The plan should be included in the license application and should include, at a minimum: (1) a detailed description of all rules, regulations, guidelines, and measures associated with non-project use or occupancy of project lands, (2) documentation of consultation with interested stakeholders, (3) an appendix containing stakeholder comments on the draft plan and Eagle Creek Hydro's responses to them, and (4) an adaptive plan for future plan revisions that includes provisions for consultation with relevant stakeholders.

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of the Shoreline Management Assessment is $30,000, including questionnaire development and distribution, study report development, and drafting of a Shoreline Management Plan. This figure could vary depending on how the questionnaire is distributed.

**Study Request #10 – Whitewater Boating Assessment**

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goals and objectives of the Whitewater Boating Assessment are to: (1) evaluate the adequacy and appropriateness of the current whitewater boating opportunities at the projects, including flow releases and access facilities; (2) assess whitewater boating opportunities in the bypassed reach between the Rio Project minimum flow powerhouse tailrace and the main powerhouse tailrace; and (3) identify

potential measures to enhance whitewater boating opportunities at the projects over the terms of new licenses.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

The Federal Energy Regulatory Commission must decide whether to issue new licenses to Eagle Creek for the projects. Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the projects, as well as power and developmental values. Any license issued must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Recreation has been identified as a project purpose by the Commission. Applicants are encouraged to develop recreation resources in such a matter that is "consistent with the needs of the area to the extent that such development is not inconsistent with the primary purpose of the project" (18 C.F.R. §2.7). Identifying effects of project operations pertaining to this resource is relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

The PAD includes only limited information on recreation at the projects, including whitewater boating, in Section 5.8.1. The PAD briefly describes the Rio Project's whitewater boating access facility and references the current whitewater boating flow release schedule, but does not include the study report from the whitewater boating study conducted in the spring of 1990 that is referenced in the current license order.[8]

[8] *See* 59 FERC ¶ 62,035

Furthermore, the PAD does not include any information on the bypassed reach between the Rio Project minimum flow powerhouse tailrace and the main powerhouse tailrace.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

The current license for the Rio Project requires scheduled weekend whitewater flow releases based on a study completed in the spring of 1990. Project operations have a direct impact on whitewater boating below the main powerhouse tailrace because the Rio Project generates power during times of peak demand, which are typically weekdays in the summer. Therefore, an analysis of the current flow release schedule would determine if any changes are necessary, and would inform potential license conditions related to the whitewater flow release schedule. Additionally, project operations divert flows from the Mongaup River below the Rio Project's minimum flow powerhouse that could possibly provide whitewater boating opportunities. An analysis of project operations relative to a range of boatable flows would help inform potential license conditions pertaining to whitewater boating opportunities in the bypassed reach.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

The Whitewater Boating Assessment will have two primary components:

1. For the current whitewater boating opportunities below the Rio Project's main powerhouse tailrace, in conjunction with the overall recreation study (Study # 8) requested above, evaluate the current flow release schedule, boater access facilities, and boating information provided at the projects. Obtain any available study report or data from the study conducted in 1990. Consult with stakeholder groups and Commission staff to determine if the existing information is adequate. If inadequate, then conduct a whitewater boating study based on accepted practices (i.e. Whittaker et al., 2005).

2. For the bypassed reach, use accepted practices for a whitewater boating study as described in Whittaker et al. (2005). The study should use a sequential three-phased approach.

    - Phase I: Use a desktop analysis to identify access options for the bypassed reach, create a gradient profile, and identify any other flow-related information that may be pertinent to recreation in the bypassed reach.
    - Phase II: Use experienced whitewater boaters to conduct an on-land feasibility assessment by scouting the bypassed reach to examine potential quality and characteristics of boating opportunities, estimate potential flow ranges, identify obvious hazards, and determine whether an on-water controlled flow study is needed to evaluate whitewater recreational opportunities in the bypassed reach.
    - Phase III: If determined to be necessary by Phase II, use an on-water controlled flow evaluation to determine the acceptable minimum and optimal instream flow needed for whitewater boating in the bypassed reach.

Prepare a study report for each phase of the study. The Phase I report should include a description and maps of potential access options to the bypassed reach, and any additional pertinent information identified about flows and recreation in the bypassed reach. The Phase II report should include an assessment of study participants' evaluations for potential quality and characteristics of boating opportunities (e.g. difficulty, type of run, type of craft likely suitable for the run), estimated potential flow ranges, obvious hazards (e.g. woody growth in the river bed), and recommendations for implementing Phase III. The Phase III report (if necessary) should include a description of the whitewater boating attributes of the range of flows examined (e.g. difficulty, unique features, portage requirements), determine the acceptable and optimal flows for the reach, the frequency of availability of the identified flows under current and any proposed project operation modifications, and incorporate relevant results from other studies to identify any competing recreational uses (e.g. fishing) or other resource needs (e.g. aquatic habitat) that may be adversely affected by any scheduled releases.

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

Eagle Creek Hydro should develop the detailed study protocol, logistics, and schedule in consultation with interested stakeholders. The estimated cost of the whitewater boating assessment is approximately $45,000, depending upon the adequacy of existing information and the extent of fieldwork conducted.

**Study Request #11 – Cultural Resources**

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to locate cultural resources that are eligible for the National Register of Historic Places (National Register) and may be affected by project O&M (including recreational activities associated with the projects reservoirs) within the FERC project boundary and respective area of potential effects (APE).[9] Such cultural resources would include archaeological sites, project facilities, historic structures, and other places of religious and cultural significance to Indian tribes. The study would determine an APE to locate cultural resources and assess specific project-related effects to any cultural resource determined to be eligible for the National Register. If existing or potential project-related adverse effects are identified on National Register-eligible cultural resources, a historic properties management plan (HPMP) would be crafted to resolve any such adverse effects and made part of any new licenses issued by the Commission.[10]

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

[9] This study would comply with all aspects as specified in the implementing regulations (36 CFR Part 800) of section 106 of the National Historic Preservation Act, as amended.

[10] Using the information and findings from the cultural resources study, a draft HPMP would be filed with a draft license application, and a final HPMP with a final license application. Prior to filing the draft and final HPMPs with the draft (or PLP) and final licenses, respectively, the HPMPs would be submitted to the New York SHPO and any involved Indian tribe for review and comment.

The results of the cultural resources study would be reviewed and commented by the New York State Historic Preservation Officer (SHPO) and any involved Indian tribe. The APE (including a description and map) would also need to be approved by the New York SHPO prior to conducting field investigations related to the cultural resources study. Any National Register eligibility recommendations to cultural resources located within the APE would also need to be approved by the New York SHPO. If existing or potential project-related adverse effects are identified on National Register-eligible properties within the project's APE, the Advisory Council on Historic Preservation (Council) must be notified and given an opportunity to comment.[11]

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

The Commission must decide whether to issue new licenses to Eagle Creek Hydro for the projects. Issuing new licenses by the Commission is considered a federal undertaking, pursuant to section 106 of the National Historic Preservation Act (section 106), and requires the Commission to take into account any existing or potential project-related adverse effects to historic properties (i.e., those cultural resources determined eligible for the National Register).

Background and Existing Information

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information*

The cultural resources section within the PAD (section 5.10) provided an APE for the projects. Section 5.10 also provided a general cultural context about cultural and historic resources in and near the project area and provided a brief summary of archaeological and historic resources within the vicinity of the projects. Section 5.10 also noted the comments from the Bureau of Indian Affairs stating that the projects are located within a historic Delaware tribal area.

Although the PAD highlighted several undetermined National Register-eligible cultural resources in and near the project vicinity, the information provided is

[11] This is usually done by the Commission when they issue a draft programmatic agreement involving a new or original license.

insufficient.[12] For example, the Swinging Bridge Hydroelectric Plant is a project facility and is within the projects' APE, but its National Register eligibility remains undetermined despite the power plant being more than 50 years old, meeting the age criteria for consideration for inclusion in the National Register. There are other project facilities (i.e., other powerhouses, wood stave penstocks, surge tanks, diversion dams, employee housing) within the APE that also meet the 50-year-old age criteria, but are not mentioned in the PAD, nor are they considered for their National Register eligibility. There is also evidence for non-project historic foundations and potentially related archaeological sites that date prior to the Civil War and exist within the projects' APE. Several historic towns dating the 19th century were known to have been inundated by the project reservoirs. Historic roads are also known near the project area, and some may have crossed into the projects' APE. There is also a potential for pre-contact archaeological sites existing within the projects' APE along the former water courses within the Mongaup River Basin which had served as a historic and traditional area for aboriginal groups associated with the Delaware Indians for hundreds of years prior to European contact.

Project Nexus

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

Project O&M have the potential to adversely affect project facilities, some of which meet the age criteria for National Register eligibility. Fluctuating water levels produced by the projects within the five reservoirs have the potential to adversely affect inundated town sites, above-ground associated historic foundations and archaeological sites, of which there is no existing information on how extensive any of these cultural resources are, or where they may exist. There is also the potential of pre-contact

[12] Note that a 1987 finding from the New York SHPO stating that the projects would have no effect on districts, sites, buildings, structures, objects, or archaeological resources eligible for listing in the National Register was based on the previous relicensing process more than 25 years ago, and does not apply to the new proposed license, which, in turn, constitutes a new undertaking, pursuant to section 106. Methods used in the 1980s to assess cultural resources for project effects and National Register eligibility would not be accepted under current section 106 standards. At present, none of the FERC project boundary for the projects has been systematically inventoried for historic properties and where assessments for project-related effects to such properties has not been conducted.

aboriginal archaeological sites being adversely affected by the reservoirs. Unauthorized activities by relic collectors utilizing designated project recreational areas could have additional adverse effects on archaeological resources along the shoreline of the reservoirs within the APE.

Proposed Methodology

§5.8(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

The cultural resources study plan should include the following proposed measures and associated tasks:

1. Upon the issuance of the Commission's Study Plan Determination, submit a definition of the projects' APE and associated APE to the New York SHPO for concurrence. Written concurrence from the New York SHPO should be obtained prior to conducting field work associated with this study.

2. Conduct a systematic cultural resources survey and inventory within the projects' APE. This would include a systematic pedestrian survey within all accessible areas of the APE using a crew of qualified professional archaeologists[13] where all cultural resources encountered would be recorded, mapped, and photographed in compliance with standards set forth by the New York SHPO. Such survey methods would reflect Phase 1A and IB archaeological assessment guidelines provided by the New York SHPO. Once archaeological resources are located and determined to be potentially affected by the projects, National Register eligibility of each site would be assessed using Phase II assessments or other appropriate measures agreed to by the New York State SHPO.

3. Conduct a survey of all built environment resources (i.e., above ground structures) that would include all project facilities and non-project facilities

[13] See Secretary of the Interior's standards and guidelines for archeology and historic preservation.

with the APE. Each built environment resource would need to be assessed as either eligible or not eligible for inclusion in the National Register, and such assessments would need to be done by a qualified architectural historian or other similarly qualified professional.[14] Work conducted should meet the New York SHPO recommended standards for historic resources survey, including maps, site records, and photographs. The possibility of establishing a historic district associated with some or all of the project facilities should be considered that would include both contributing and non-contributing elements. Specific project-related effects would also need to be determined on each built environment resource located with the APE.

4. Contact the Delaware Nation and Delaware Tribe to see if they know of any place of religious or cultural significance (i.e., traditional cultural properties, past villages or sites, gathering areas) and allow them to comment on the cultural resources study in draft and final form. If such cultural resources exist within the APE, assess National Register eligibility (if applicable), and potential or existing project-related effects. This element of the study should be conducted by a knowledgeable person with anthropological training when talking and gaining information from the Indian tribes.

5. State in the study plan, that if there are historic properties within the APE that would be potentially affected by the project, that a draft HPMP would be crafted, in consultation with the New York SHPO and involved Indian tribes, and filed with a draft license application (or PLP), and that a final HPMP, first reviewed by the New York SHPO and involved Indian tribes, would be filed with the final license application.[15] The HPMP would provide measures to resolve any existing or potential project-related adverse effects to historic properties.

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[14] Ibid.

[15] For crafting a HPMP, use the Council and FERC's Guidelines for the Development of Historic Properties Management Plans for FERC Hydroelectric Projects, issued May 20, 2002.

6. Prepare a cultural resources report based on the tasks above, including a detailed section on the cultural history of the project area, previous studies near and within the projects' APE, methodologies used for field surveys for archaeological resources, built environment resources and pertinent information from Indian tribes on places of religious and cultural importance.[16] Include a section that details the consultation history with the New York SHPO, involved Indian tribes, and any other persons or entities who participated or commented on the cultural resources study. Include a section that details the cultural resources located within the projects' APE, which ones were determined eligible or not eligible for the National Register, and which ones are being adversely affected by existing or future project-related activities. This report should be crafted by a qualified cultural resources professional.

Level of Effort and Cost

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of the study and report preparation is approximately $100,000 and should be completed within one study season. Eagle Creek did not propose an alternative study.

[16] Due to sensitive archaeological information and maps, mark the cultural resources study report as "privileged' and request that the Secretary of Commission place it in our non-public file. Also distribute the same cultural resources study report to the New York SHPO and interested Indian tribes. This should also be done for any HPMP filed with the Commission.

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## Schedule B

## Additional Information

### Aquatic Resources

1. The PAD, section 6.3 *Potential Studies*, states that an instream flow study for bypass and river reaches within the basin was completed by Stetson-Harza (1988), and that Lawler et al. completed a study on the effects of the projects on water quality, fish stranding, and streambank scouring (LMS 1999). However, these studies were not provided with the PAD. So that we may determine whether the studies are sufficient to meet our information needs and support a licensing decision please file the referenced studies and include with the proposed study plan.

2. The PAD, section 5.4.1, states that Lawler et al., conducted empirical entrainment studies at the Mongaup Falls, Swinging Bridge, and Rio Projects in 1992 and 1993 (LMS 1994). However, these studies were not provided with the PAD. So that we may determine whether the studies are sufficient to meet our information needs and support a licensing decision please file the referenced studies and include with the proposed study plan.

# United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Maine-New Hampshire Fish and Wildlife Service Complex
Ecological Services
Maine Field Office
P.O. Box A
306 Hatchery Road
East Orland, Maine 04431
207/469-7300 Fax: 207/902-1588


April 7, 2022

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

**RE: Revised Study Plan Comments for the Ripogenus (FERC No. 2572-133) and Penobscot Mills (FERC No. 2458-247) Hydroelectric Projects**

Dear Secretary Bose:

This is the United States Fish and Wildlife Service's (Service) response to the Revised Study Plan (RSP) for the Ripogenus and Penobscot Mills Hydroelectric Projects (collectively referred to as Project or Projects), located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot Counties, Maine. The RSP was submitted by Great Lakes Hydro America, LLC (GLHA; Applicant) on March 23, 2022.

## COMMENTS

General

GLHA did not incorporate any of the Service's Proposed Study Plan (PSP) comments into the RSP therefore, rather than reiterate our position, the Service respectfully requests that the Federal Energy Regulatory Commission (Commission) approve the studies requested in our October 7, 2021, Pre-Application Document (PAD) comment letter and February 2, 2022, PSP comment letter.[1,2]

Additionally, the Service supports the Extension of Time request submitted by the National Marine Fisheries Service (NMFS), to allow all stakeholders sufficient time to review all ten years of operations data provided by the Applicant in the RSP.[3] All parties to this licensing

[1] Accession No. 20211007-5023
[2] Accession No. 20220222-5270
[3] On October 8, 2021, the Commission issued an Additional Information Request for detailed operations data which was needed to clarify how the Projects are operated on a daily basis. Specifically, the Commission requested GLHA

proceeding should be allowed to have a precise understanding of the Projects modes of operations to identify any potential effects to environmental resources in Project-affected areas. As stated by NMFS, stakeholders will use the additional 60 days to analyze Project outflows and impoundment elevations and provide the Commission with well-informed comments on the RSP which will ultimately benefit the Environmental Assessment (EA) for this relicensing.

Upstream American Eel Passage Assessment Study – Presence, Distribution, and Relative Abundance

In the RSP, the Applicant proposes "…to utilize the eDNA methodology suggested by MDMR to evaluate the current distribution of American eels upstream of the Projects (Appendix D of this RSP)." GLHA states, "This initial step will inform the relative abundance of eels upstream of the Project developments." However, the abundance and distribution of eels is not in question in this licensing proceeding. Based on existing information, including GLHA's PAD for the Projects, we know that the West Branch of the Penobscot River is historic habitat for eels and that they are currently present in the impoundments above each dam. The PAD states, "Juvenile eels have the ability to ascend damp, rough surfaces of dams, resulting in their distribution above dams in the Project areas (Gulf of Maine Council on the Marine Environment [GMCME] 2007). They also inhabit West Branch riverine habitats and have been documented in fish assemblage catches from the 1980s (FERC 1996) and more recently in 2004 (Yoder, et al. 2008)." Therefore, upstream eel passage siting surveys are needed to determine the optimal locations for siting permanent upstream eel passage facilities at each of the six dams as this information does not exist and a presence, distribution, and relative abundance study is not needed.

> **Service recommendation:** The documented presence of eels alone has elicited the Commission to mandate installation of eelways in its Environmental Assessments at other projects in the Service's Northeast region, most recently at the Blackstone (FERC No. 3023-014), Woonsocket Falls (FERC No. 2972-027), and Central Falls (FERC No. 3063-021) Hydroelectric Projects.[4] Therefore, since the presence and distribution of eels is already known in the West Branch, as stated above and in the Applicant's PAD, the Service respectfully requests that the Commission approves the Service's upstream eel passage study as outlined and described in our PAD and PSP letters.

In addition to the above comments, the Service supports the study requests and clarifications submitted to date by NMFS, the PIN, the Department of Marine Resources, MDIFW, Trout Unlimited, Ed Spear, and the other Non-Governmental Organizations (NGO's) participating in this proceeding.

Thank you for this opportunity to comment. Please direct any questions to Julianne Rosset at julianne_rosset@fws.gov.

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include 10 years of operations data (in excel format) for each dam, and that this information be filed with GLHA's PSP on, or before, November 23, 2021. However, the requested data was not provided by GLHA by the Commission's November 23rd deadline. On March 23, 2022, and concurrent with GLHA's RSP (four months after the Commission's deadline) some of the requested data was filed, leaving only 15 days for stakeholders to review and comment on ten years of data.

[4] Accession Nos. 202007-3007 and 20210114-3028

Sincerely,

AMANDA CROSS

Digitally signed by AMANDA CROSS
Date: 2022.04.07 12:32:37 -04'00'

Amanda S. Cross, Ph.D.
Project Leader
Maine Field Office
Maine-New Hampshire
Fish and Wildlife Service Complex

cc: FERC, Secretary (e-filed)
PIN, Dan McCaw
NMFS, Dan Kircheis, Jeff Murphy
MEDEP, Kathy Howatt
MEDMR, Casey Clark
MEDIFW, John Perry, Kevin Dunham
RO/Fisheries, Bryan Sojkowski
TU, Steve Heinz
ES: JRosset:04-04-22:(207) 298-3080

## LITERATURE CITED

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Kate McArthur, Arlington, VA.
The flow study is needed specific to the “dry way” due to its unique hydrologic features. A thorough analysis should be done before all rules and regulations pertaining to the waterway on both environmental and economic impact. Currently residing outside of this area, guaranteed releases would encourage me to travel to this location more frequently if there is reliable access to the Penobscot. Lastly, events which focus on sections of river specific to whitewater draw visitors both across the country and internationally. Not only does this increase economic attention to the area, it also encourages a community of paddlers come together to celebrate and preserve rivers such as the Penobscot.

Charles WAtkins, Dorchester, MA.
Any whitewater kayaker in New England knows that the W Branch Penobscot is one of the most pristine, wild, and beautiful runs in the country. For that reason, I am writing to inform FERC of the environmental, economic, and recreational value of providing releases on the Dryway and Millinocket stream. I am certain that if recreational releases were scheduled on the Dryway of the W Branch Penobscot, hundreds of paddlers from all over the country would attend, bringing money and life to the local community. As evidence, please see the Maine Whitewater Championship - a race on the W Branch that brings roughly 100 paddlers and many more spectators per year to race down the river.
My understanding is that Brookfield has proposed a virtual flow study based on testimonials and video footage to determine proper flows for the Dryway section and Millinocket Stream. I believe that this method would be less effective, less safe, and more costly than an in-person physical flow study. Whitewater paddling is an inherently physical and dangerous activity, so it is important that in-person representatives from the community are able to experience and evaluate potential flows in order to inform Brookfield's decision around recreational releases. Members of American Whitewater and the AMC have taken part in many physical flow studies in New England and across the country, and therefore are able to use them in the most efficient, safe, and productive way. I hope that FERC and Brookfield will hear the opinions of the local paddling community and work towards establishing a long-lasting relationship to benefit the people of northern Maine.

Ryan Waterhouse, Rochester, NH.
We would very much love regular recreational releases of the "dryway" section of the Penobscot river. Please please do everything in your power to bring this opportunity to a very special community. Thank you.

Brooks cannon, Biddeford, ME.
Hello, I am writing you to tell you how important it is to the state of Maine's residence, tourists and whitewater community that Ripogenus dam have guaranteed water flows in the summer, spring and fall for whitewater rafting and kayaking. This section of the Penobscot river gives many people jobs, purpose and recreation and we would like to keep these rights to use the put in points for recreation and commercial use as well. We would also appreciate it very much if there were scheduled releases from the dam itself so this beautiful section of whitewater is accessed more dependably.

Thank you for your consideration
Brooks cannon
River guide
Recreational whitewater kayaker

Brian Olas, Portland, ME.
I am writing this comment today regarding Docket P2572-133.

As a user of the West Branch of the Penobscot River as a private paddler for over 20 years, I wanted to advocate for a consideration of a more comprehensive flow study of the section of river known as the "Dryway" above McKay Station. The near mile long section has excellent whitewater qualities inside a gorge that has had little in the way of historical flow data to take into consideration. This section is a prime location to develop future whitewater activities that could bring in real economic activity to a struggling but upcoming part of rural Maine. Millinocket is a town that could benefit from additional eco tourist events such as a whitewater river race or canoe races on the lower section of the river.

Thank you for the opportunity to comment.

Brian Olas
North Yarmouth Maine

Brian Olas, NORTH YARMOUTH, ME.
My name is Brian Olas of North Yarmouth Maine, long time recreational user of the West Branch of the Penobscot River. As a part of my experiences inside the Penobscot River Corridor as a Maine Whitewater and Recreational Guide for 22 years now, I have long looked at the section of the West Branch of the Penobscot known as the "Dryway" for potential whitewater recreational opportunities. This section of the river has very little in the way of historical data flow information on record. This nearly one mile stretch above McKay Station is worthy of a flow study that could impact future economic activity in an area known for its up and coming eco tourism investments. Real opportunity exists for nationally sponsored kayak races to canoe races further down the river. In fact, this is the first year of a newly developed canoe race scheduled for June 2022. With the addition of the "Dryway" the Penobscot River contains some of the best whitewater on the East Coast of the US. The current flow study's provided do not detail this section in any meaningful way.

As a member of American Whitewater, I can appreciate when hydro relicensing comes under review. It gives us time to look at opportunities for the future of such recreational places like this one under review now. American Whitewater has been very successful in working with FERC to develop paddling opportunities all over the country. Places like the Gauley River in West Virginia now have very successful festivals that attract paddlers all over the world that bring real and lasting economic value to the community.

Thank you for the consideration of a flow study for the "Dryway"

Brian Olas
American Whitewater Member
Maine Recreational Guide
Private Whitewater Paddler

Nathan Warren, Plymouth, MA.
As a longtime whitewater paddler, former outdoor educator and high school teacher, and current professor of business, I wanted to urge the parties involved in relicensing the Ripogenus Dam to fully consider the needs of the whitewater community and benefits of whitewater recreation to the local and regional communities.

First, the “dryway” section of river is a unique resource with few comparisons. It deserves an on water physical flow study. I believe any opportunity to expand recreational possibilities and impacts on the local economy should be thoroughly studied before major rules are made. If the dryway section had recreational releases, I and many others would be more likely to travel from out of state to take advantage of recreational releases and paddle the Penobscot. I have already participated in many whitewater festivals and events around New England and the country. These festivals are often hosted around recreational releases and they are good for the paddling community and local economy.

Christopher Howe, kingfield, ME.
I’m writing on behalf of myself as a raft guide who has worked on the West Branch Penobscot River since 2009. I currently now manage North Country Rivers Penobscot, located at the Big Moose Inn just outside of Millinocket.
It is absolutely imperative for the local economy that at the very least Brookfield Renewable Power maintains current license agreements as was written in the 1996 License when it comes to flows for whitewater rafting below McKay Hydro Station. To limit or reduce any of these releases would have long-term detrimental impacts on the Penobscot commercial rafting industry, which has significant economic influences in Millinocket and the greater Katahdin Region.
Not only should we maintain what we already have, but we must also thoroughly study and properly assess all whitewater boating opportunities that are affected by Millinocket Lake Dam, Ripogenus Dam, and the Stone Dam.
Ever since the Great Northern Mill shut down in the early 2000s Millinocket’s economy has suffered. Outdoor recreation remains a huge asset to the town in providing direct income for many residents and businesses. Since recreation has already proved its economic power to the area for the last 20+ years it only makes sense for the Katahdin Region and Brookfield Renewable to further invest in and expand recreational opportunities in town.
The old Great Northern Mill site in Millinocket is being revitalized and thousands of square feet of industrial space are up for grabs thanks to an organization called Our Katahdin. This plot of industrial land has already attracted the attention of many big companies that are looking to invest and grow their businesses in Millinocket. One of them being Nautilus Data Technologies. Which is going to start construction on one of the world’s greenest large-scale data centers. They use the Penobscot River to create electricity and use cold water from the river to cool the computers which is revolutionary.
With large-scale investments and job availability potentially spiking in Millinocket for the coming decades that this license entails. Plus combine this with individuals and families continuing to move away from cities to more rural locations with widespread outdoor recreational opportunities. The Katahdin Region could use every bit of recreation we can to help draw in potential employees for these businesses and families who are looking to move to a place where they can work, live, and play in their backyard
The future possibilities and the history in this region make it essential that recreational boating opportunities affected by these 3 dams are thoroughly studied and assessed, so we can fully understand what it takes to provide new scheduled recreational whitewater assets to the area and what the long term beneficial effects could be with expanded recreational releases, for the economy of Millinocket and the wellbeing of its present and future youth and residents. A schedule of recreational releases from these 3 dams can literally facilitate a whitewater boater from complete novice to expert all within 45 min of Millinocket.
The most important aspect when thinking about the future implications of these releases is the amount of change that can happen in a community during the duration of this license agreement. Thinking back on the scale of change that has occurred in Millinocket since the current license agreement was filled in 1996 is imperative to the thought process here. When considering this new agreement we must acknowledge all future possibilities and the scale of positive change that can

happen for the Katahdin Region over the duration of this agreement.
Although it appears no current whitewater rafting outfitter wants to expand their business by offering an additional mile of class IV/V through the Dryway, a new owner down the road might. As a 14-year commercial guide and a manager from one of the top outfitters in the state, and someone who was rafted and kayaked all over the country. Commercial rafting in the Dryway is possible with the right water level from Ripogenus Dam and proper safety regimen on behalf of the outfitter. There has been only 1 attempt to officially determine the feasibility of commercial rafting in the section between Rip Dam and McKay Hydro Station. This took place over 40 years ago in the mid-80s when Great Northern Paper Company was attempting to build the Big A Dam. The lake behind the dam would have buried the best rapids on the West Branch of the Penobscot so they put together a test to check out the Dryway, which was unsuccessful and is an incredible story. However, this was again over 40 years ago when they were in floppy, non-bailing, rubber rafts. Today we have self-bailing rigid PVC rafts, a rigorous Guide Training, and testing program, and a completely different perspective on river running that has evolved over 40+ years of successful rafting trips in Maine. It is a fact that this license agreement will last beyond all the careers and lives of these first-generation outfitter owners. During the next 3 decades that this license will be in effect, almost all of the major outfitters will either close, consolidate, or fall under new ownership. If a new generation of commercial rafting is what is going to happen in Maine all future business expansions pertaining to commercial rafting and boating should be considered.
Brookfield has stated in their revised study plan that they want to use videos and pictures from the internet along with anecdotal data from paddlers to complete such flow studies. It is my strong belief that this methodology is completely insufficient to obtain proper data to make such lofty long-term assessments. Their proposed methodology would possibly be okay for a sort of short-term assessment. However, we are talking about a 30-year contract, and this length of time surely justifies the most thorough and accurate studies available so all parties involved can come to a fair and data-driven agreement.

Casey Tull, Grand Rapids, MI.
I have been fortunate to visit Maine 5 times now in the early summer season. The sole reason for my visits was because of the incredible nature the state offers, specially the whitewater. I firmly believe the natural flow of the water is a lot more crucial to the ecosystem than any amount of energy potentially produced. There's are many ways to provide energy to communities, but creating a river is unmatched to the power of nature. Thanks for your consideration.

Dan Bernard, South Portland, ME.
The flows coming out of Rip Dam have changed my life and the life of many others. They have created a recreational outing that occupies peoples' weekends and summers, challenges youth and adults alike to develop a wide range of technical skills, strengthens the economy of Maine and Millinocket by attracting tourists from all over the world, and generates a community centered around the whitewater that is one of the strongest groups of people I have ever met. This is all due to the water that flows and our access to it.

We cannot lose these rights. In fact, we must strengthen our relationship with the river.

For the next relicensing period, I would like to see:

-Guaranteed whitewater flows (at least 2000 cfs during the months of May - September) to allow rafting and kayaking and other boaters to reliably enjoy the river, recreationally and commercially.
-Scheduled Ripogenus Dam water release days providing whitewater flows for a handful of days every summer (at least 2000 from the dam), much like the Dead River releases or the Seboomook releases. This will provide an educational opportunity to study the effects of high water in the "dryway" portion of the river between the dam and the power station, and will most certainly attract hundreds of people from all over the country and beyond to harvest the beautiful whitewater through the upper gorge. It is an untapped resource that would be one of the best flowing stretches of water in the country. It's better than the Dead, it's better than the Kennebec, it's better than the rest of the Penobscot, and the water does not belong to Brookfield! Let's make it happen!
-Maintain all access points to the river that currently exist, no matter what!
-Allow private boaters to access the river resource without restrictions.

Thank you for reading and considering my comments. Looking forward to being on this river for the rest of my life!

Kimberly D. Bose
April 21, 2022
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426 Via Electronic Filing

Penobscot Mills Hydroelectric Project (FERC No. 2458

RE: In Support of Maine Department of Inland Fisheries and Wildlife's Request to Radio Tag North Twin Impoundment Landlocked Salmon

In its April 7, 2022 filing, the Maine Department of Inland Fisheries and Wildlife (MeDIFW) filed Comments on the Revised Study Plan for the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458). This recent MeDIFW filing repeated earlier requests to include radio tagging of North Twin Impoundment landlocked salmon (salmon) in studies proposed by the Licensee in the Revised Study Plan. This filing is in support of "Study Request 8".

MeDIFW Study Request 8: Landlocked Salmon Habitat Use/Spawning Study

Penobscot Mills Project

*MDIFW continues to recommend a landlocked salmon radiotelemetry tracking study be conducted in the North Twin impoundment. The goals and objectives of this study include:*

- *Track seasonal movements and behaviors of landlocked salmon (within and between the five connected lakes) via radiotelemetry.*
- *Determine the effects of annual Project drawdowns on the movement and behaviors of landlocked salmon within the North Twin impoundment.*
- *Identify landlocked salmon spawning areas within the North Twin impoundment.*

I fully support MeDIFW's Study Request 8 that includes radio-tagging as it is the only method of determining potential project impacts on salmon spawning behavior e.g., movement, accessibility to spawning areas, distribution, timing and

ultimately, success. Locating, enumerating salmon, and photographing the stream bed accomplish nothing. However, I recommend this procedure for the West Branch above and below the Ripogenus Impoundment (P-2572). Great Northern Paper studied North Twin Impoundment salmon population from 1978-1989 and the results are included in the 1992 license application. Initially, these studies (tagging, creel surveys) were designed to determine possible interaction between salmon in the river reach below McKay Station (P-2572) and the North Twin Impoundment. Beginning in 1985, fish and angler surveys focused on the North Twin impoundment. Radio tagging was in its infancy and small radio tags were still being developed. Therefore, salmon were collected with trap nets and jaw tagged before being released near the collection site. Recapture of tagged salmon was through creel surveys or by trap net. Both methods of capture and recapture are passive in nature. Each depends on where nets are set or anglers fish and the movement of the tagged salmon. The results of these studies were that large areas of the impoundment were unsampled. The 1980's salmon taggings did confirm that fish moved toward Nahmakanta Stream and West Branch during the fall. However, the time between the initial tagging and subsequent recapture was weeks, months, and even years. Therefore, GNP fisheries data collected during the 1985- 1989 Penobscot Mills relicensing effort <u>is unsuitable</u> in regards to meeting current MeDIFW North Twin Salmon Spawning study objectives.

The Licensee in its March 23, 2022 filing rejects MeDIFW's radio tagging proposal (10.0 Deviations from Requested Study) basically stating a number of unsupported reasons e.g., "*when, and where adult fish are sourced, available sample size, and prevailing impoundment levels at the time of the study. Source fish would need to be wild fish collected within the approximately 18,000-acre North Twin impoundment. There would be no way to know the natal stream origin of adults captured for tagging, and therefore where such tagged fish would be inclined to go to spawn, resulting in potential spawning tributaries being overlooked due to a lack of fish native to that particular stream having been tagged."* The Licensee misses the point and has likely not reviewed the 1992 license application. The North Twin impoundment is now managed for wild salmon, stockings were discontinued in 2017. In the unlikely event stocked fish are captured and radio tagged, aging (scale reading) would reveal their hatchery

origin. There are only two North Twin Impoundment tributaries with flow and size capable of supporting significant salmon reproduction. The Jo-Mary system offers a third possibility. As the study issue is spawning access and success, the natal stream is largely irrelevant.

,

It is clear that radiotelemetry is the only viable method of meeting MeDIFW's goal of determining "*seasonal movements and behaviors of landlocked salmon".* Collections of fish suitable for radio tagging e.g., wild, adult fish, is relatively simple and radio tracking will product thousands of data points over the four - eight week pre spawning and spawning periods. Both South Twin and Pemadumcook lakes have excellent trap netting sites and adult salmon collected during the 1980s exceeded one fish a trap net day. Given the relative ease of salmon collections, in order provide robust study results, I recommend that the final study plan requires the licensee to provide MeDIFW with an adequate number of radio tags. Without the use of radio tags, the MeDIFW study goals can not be met and time and resources wasted.

Spawning and spawning success, in this case landlocked salmon, is a critical factor in determining ongoing project impacts. Salmon are the principal, perhaps only, cold water fish species in the project area. Understanding the spawning behavior of salmon in the North Twin Impoundment waters will help the FERC staff balance existing uses. I fully support MeDIFW's very reasonable and much needed Study Request 8.

Thank you for the opportunity to comment.

Ed Spear

307 Mt Hope Ave.
Bangor, Me 04401
Email; edspear1@yahoo.com
Phone: 207-217-4288

Alexander Tragakes, Windham, ME.
Hello,
The "Dryway" is a speacial piece of the Upper West Branch of the Penobscot. Something I have only ever been able to witness from land on few occasions. This is certainly a respectable section of whitewater that deserves to be understood and appreciated by learning what flows offer what types of experiences to whitewater boaters. Understanding how flow rates affect these rapids is impossible to do from a camera. I believe it is absolutely necessary to conduct on water studies of this section of river by professional and private boaters to determine optimal flow rates for recreational possibilities on this section of the West Branch.
I believe that adding additional opportunities to host outdoor experiences in the greater Millinocket area can have a big impact on the local economy and the businesses that operate there. This study of new activities in the area has the potential to offer a bigger draw to the area and bring more visitors to local businesses. This also could offer an additional river section for hosting paddling events, which offer opportunities for even more people to visit this special area.
I live in southern Maine and new recreational releases on the Dryway section, hopefully at varying flow rates for different skill levels, would absolutely be a reason that I would come to Millinocket over other whitewater locales both in the state and in New England.

Christopher Howe, kingfield, ME.

I'm writing on behalf of myself as a raft guide who has worked on the West Branch Penobscot River since 2009. I currently now manage North Country Rivers Penobscot, located at the Big Moose Inn just outside of Millinocket. I want nothing but a prosperous and healthy future for the Millinocket Region, and this new license agreement and my proposals can play a much larger role in achieving this goal than any of us could ever imagine for the Katahdin Region.

Millinocket Stream is an incredible asset to the town of Millinocket that is completely underutilized. Its numerous mellow rapids, benign nature, and long smooth pools make it a dream whitewater run for the novice to intermediate paddler. Or an ideal venue for classes and education in whitewater kayaking, canoeing, paddleboarding, and swift water rescue.

The opportunities to expand recreational releases on the Millinocket Stream I think are quite appealing to the economic benefit of Millinocket, especially when considering such economic benefits compounding over a 30-year period. I also believe that releases can be managed relatively easily on the behalf of Brookfield. Millinocket Stream on a regular year dumps quite a bit of water down this reach each spring to maintain lake levels on Millinocket Lake. Often I've seen boatable flows on the Millinocket for a good chunk of May and June, due to the large watershed of the lake.

I believe it is entirely reasonable for Brookfield to consider scheduling out weekend releases on the Millinocket during the months of May, June, and possibly July when they already have to dump water during this period anyway especially since there is no direct Hydro energy production from this location. It seems possible Brookfield could just release flows on scheduled days so whitewater paddlers, education groups, commercial outfitters, outing clubs, event directors, and local school outing programs can plan in advance, market, and promote whitewater lessons, courses, outings, and events. Outdoor Sport Institute (OSI), a non-profit based in Millinocket offers whitewater kayaking lessons for youth and adults who would directly benefit from rec releases along with other registered Maine rec and fishing Guides, commercial whitewater outfitters, and school recreation programs. Outdoor Sports Institute director and I say that the learning environment on Millinocket Stream is perfect. Herein lies the very reason it is imperative Brookfield provides thorough, on water, and in-person flow studies. Because words are only words. I can go on and on about my perspective of how great this stretch is. However, when it comes time to officially determine and make further decisions in this process my words or the director of OSI's words are "anecdotal" data that has zero weight in any sort of real legal setting and can be written off as here say.

What separates Millinocket Stream apart from the other river reaches in the re-licensing and why it is so important is that it's available to a much broader demographic of people, especially youth. Maine currently has a healthy regimen of rec releases on the Penobscot and Kennebec Rivers which are class III and above Rivers. Adding the class I/II/III section of the Millinocket Stream will help complete a cycle of natural progression in Whitewater Kayaking in the state which will in turn create a sustainable economic return for all communities that are affected by such rec releases. For example: Johnny is in high school and wants to learn whitewater kayaking because he did the Kenduskeag Canoe Race with his uncle.

He convinces his parents to enroll him in the Outdoor Sports Institute Beginner whitewater course offered on Millinocket Stream. Johnny falls in love with whitewater in high school and decides to take a job as raft guide during the summers while attending college, while progressing his passion and skills in whitewater kayaking. Johnny obtains his degree and moves to Portland and gets a job at Maine Med. Johnny works hard and needs time to decompress on time off so he continues traveling to Millinocket to paddle on his favorite rivers he learned and spent so much time on. Johnny doesn't like going alone so he recommends classes with OSI to his co-workers, before you know it Johnny and his group of friends head up to Millinocket most weekends to take advantage of recreational releases while going out to dinner, buying groceries, staying at campgrounds and hotels in the community. Johnny progresses enough in his career to where he can afford a second home in Millinocket for his friends and family.  Eventually, Johnny signs up his kids for a beginner whitewater class that OSI is offering on Millinocket Stream and the cycle starts again. That is just one example of sustainable economic growth the Katahdin Region could see because of scheduled releases on Millinocket Stream. The economic benefits of such a regimen of releases on Millinocket Stream could have tremendous and far-reaching economic impacts on the town, outfitters, and other businesses.  Therefore recreational boating opportunities must be studied completely and thoroughly especially considering the duration of the license. Anecdotal data and content from the internet are insufficient when trying to gather solid data to understand the recreational opportunities downstream of Millinocket Dam. Brookfield must give incremental releases of water to a group of paddlers to best understand minimum and optimum flows, so parties involved can come to a reasonable data-driven agreement that will satisfy all stakeholders in the re-licensing of this watershed.

Thank you for the opportunity to comment,
Chris Howe

Kimberly D. Bose
April 25, 2022
November 9, 2021
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426 Via Electronic Filing

RE; North Twin Project P-2458-247

Comments and Study Requests: Great Lakes Hydro America Proposed Instream Flow and Habitat Assessment in West Branch Downstream of Stone Dam Study Plan

Great Lakes Hydro America (the Licensee) continues to emphasize energy production over fisheries and aquatic community's needs. The best example of this strategy can be found in the *Proposed Instream Flow and Habitat Assessment of West Branch Downstream of Stone Dam Study Plan*. The Licensee, with support of the Maine Department of Inland Fisheries and Wildlife's (MeDIFW) Enfield Regional Office, is suggesting that a "put-and-take" hatchery brook trout fishery should be the Flow Study's focus, and that the adult life stage should be used in evaluating habitat suitability. While not clear, it appears all life stages of landlocked salmon will be included and habitat requirements evaluated.

The Licensee is proposing an Instream Flow and Habitat Assessment in West Branch Downstream of Stone Dam Study that focuses on hatchery brook trout. A "put and take" brook trout fishery is not an achievable goal. In summary, the licensee is proposing a study of adult brook trout habitat requirements, ill-suited for local recreational demands; and a <u>hatchery product they can not provide</u>. Both are in contradiction to published MeDIFW landlocked salmon management goals

While the MeDIFW stocks Maine waters everywhere with brook trout, the mitigation program (Article 413) agreed to by the Licensee for Millinocket Stream has been an on-going failure since the early 2000s due to the lack of fish, effort, interest or all three. Namely, <u>there have been NO Millinocket Stream spring</u>

stockings of trout "1/3 to one pound" since 2010 (MeDIFW archival records are not provided on the website before that date). Brook trout stocked in October as the fishing season concludes provide very limited fishing opportunity and do not meet mitigation goals. The failure to meet the FERC Article 413 requirement of spring stockings of suitable size brook trout over an 11 year period is a 401 WQC violation. This failure also emphasizes the frugality of including stocked brook trout in the proposed West Branch Channel study. Now, the Licensee would have us believe that stocked trout are the way to go, and that this time we should believe that they will be able to follow through with License mandates. Natural (salmon) production is more dependable than Brook Trout stocking and an achievable MeDIFW goal.

Essentially conducting a flow study for a "put and take" brook trout fishery is an oxymoron as this life stage requires no flow. This study request makes no sense. There are ample stocked waters including nearby Millinocket Stream that provides both easy road and foot access. Historically, 1996-2001 Millinocket Stream stockings provided less than two weeks angling opportunity (see Great Northern Paper's creel survey files) and less in recent years as there are no spring trout stockings that met Article 413 guidelines. Brook trout inhabit a variety of waters including vernal streams, beaver Ponds, and small flowages, they require ZERO flow. Brook trout habitat suitability curves have no nose velocity requirement i.e., they do not require water currents, although trout do require water and depth. Under the Licensee proposed study parameters, the results are known. Low inflow, perhaps 25cfs will do the trick. This is not practical fisheries management and it contradicts MeDIFW's published goals and environmental analysis envisioned in the NEPA. FERC needs to act to ensure that all salmon life stages as well as macro-invertrabrate communities are evaluated and provide information that can be used in balancing the resources in this section of river.

The Licensee in its obfuscatory Study Plan for Instream Flow and Habitat Assessment in West Branch Downstream of Stone Dam fails to consider a number of abiotic factors that doom this bizarre unscientific plan. Flow records contained in the licensee's filing provide evidence of "spring/early summer" spill events, these events would "wash" downstream hatchery brook trout, ill adapted for life in the wild. In addition, the licensee has failed to consider angler and hatchery truck access to and from the study reach and then foot access along an alder lined

rocky riverbank that lacks foot tails that can not be reached without crossing the watered West Branch Channel. The 1996-2001 "success" of the nearby Millinocket Stream put-and take trout fishery was a result of easy angler access as anglers could easily drive to and then walk literally 100 feet to fish.

A few comments follow;

1.0 Study Requests

This section of the study plans states that "put and take" (hatchery) brook trout will be the focus of the study. As noted below, the selection of hatchery brook trout is worse than arbitrary and focuses on a life stage that needs little flow and then for only a two week period. This proposal clearly reflects the Licensee's continuing effort to find study outcomes that support extremely low flows in the channel below Stone Dam. The Licensee has developed an outcome and found a study fish (life stage) to produce the desired results. This is the exact opposite of the scientific approach of first conducting a study. FERC staff is clearly aware of the licensee's continuing attempt to choose hydro-electric generation over fish, aquatic communities and boating needs. There is no "balancing" in this study proposal.

2.0 Goals and Objectives

• *Evaluate the potential for alternative minimum flows in the West Branch below Stone Dam to support a seasonal coldwater sport fishery*

The Licensee is preemptively and arbitrarily setting its own study plan objectives and accompanying outcome. There is nothing "seasonal" about a future Stone Dam tailwater salmon fishery. Salmon of all life stages would thrive in the area below Stone Dam as do salmon populations presently/historically existing below North Twin Dam and the Millinocket facility. The information available (see Penobscot Mills 1991 License Application) demonstrates the West Branch Downstream of Stone Dam, with appropriate flow, can clearly support a "year-round" salmon fishery and juvenile salmon production and meet MeDIFW published salmon management goals set forth in **both current (2002-2021) and the (draft) FISHERIES STRATEGIC PLAN 2021-2035. Goals of these plans include;**

- **statewide management goals for landlocked salmon are to maintain the current distribution of principal fisheries for landlocked salmon, provide**

**for a diversity of fishing opportunities, maintain and where possible expand the contribution of wild salmon to the population**

**The 2022 plan adds;**

**Maintain or enhance existing (salmon) populations *(High Priority)***

*"Identify potential strategies—including regulation, partnerships, habitat modification, ….."*

***Maintain healthy and sustainable landlocked Atlantic salmon fisheries***

*"Advocating for in-watershed land and water management practices that maintain or enhance spawning and rearing habitats for wild populations, where populations are not overabundant*

I also request that macro invertrabrate suitability be added to the species study list. As any salmonid species (including any ephemeral stocked trout population) inhabiting the West Branch Channel will require food, this is a very basic and reasonable request. I suggest Hydrophyscid caddis, as they are both common to the drainage and are an important and widespread food source for salmonid populations inhabiting the West Branch Drainage (see Vol VIII table 34 of the Ripogenus Application and Vol VII Table 17 of the Penobscot Mills Application)

**3.0 Resource Management Goals**

*Due to changing MDIFW fisheries goals and growing angler pressures in the region, MDIFW is trying to establish a seasonal put-and-take fishery in this resource [Back Channel] to provide more angler opportunities. Given changing MDIFW management objectives for this resource since the original license was issued, MDIFW requests that minimum flows be re-evaluated at the Back Channel (MDIFW 2021a).*

I am a proud MeDIFW alumnus, and in my brief MeDIFW career and during my 25 years with GNP, I attended perhaps a dozen MeDIFW division meetings. Interesting formats, new ideas and old issues were discussed. Being a change in policy *(changing MDIFW fisheries goals*), the use of the West Branch channel as put-and- take trout water would have been a likely discussion topic. Any meeting notes from those division or other meetings would provide insight into this proffered disturbing change in management directions.

Brook trout are widely stocked in Maine waters, including the Millinocket area (see www.maine.gov/ifw/fishing-boating/fishing/fish-stocking). In my January 7, 2022 filing, I asked for documentation e.g., creel survey, angler questionnaires, of "Given changing MDIFW management objectives for this resource", namely the need for a "put-and-take" stocked brook trout fishery in a relatively inaccessible location. I realize that MeDIFW staff(s) have many mandated tasks however, these data have not been provided. Additionally, "establish a seasonal put-and-take fishery" is misleading. The product, hatchery brook trout stocked each spring prior to 2010, existed in the nearby Millinocket Stream (Article 413) for a week or two. By definition, "put and take" is ephemeral. The only parameters that need to be established, and these are serious questions, how will anglers access the rocky/boulder 2 ½ mile reach? What method will be used to get a hatchery truck across a wetted channel and then 2 ½ miles downstream over an abandoned 4 wheel drive road?

More importantly, MeDIFW's request for a "put and take" brook trout fishery defies current fisheries and management objectives stated in the 2002 and draft 2021 MeDIFW salmon management plans. These plans (published goals) include; producing wild salmon, enhancing habitat and creating riverine salmon fishing opportunity. What is the purpose of having peer reviewed state wide resource plans, regarding landlocked salmon in this case, if they can be arbitrarily ignored to meet power generation goals?

4.0 Study Area *The study area will be the West Branch from Stone Dam to Grand Falls (Shad Pond backwaters to the toe of Grand Falls).*

My understanding of the "flow study process" is that interested stakeholders are included in the process, including study site selection. As I participated in the 1989 study, I would like to be part of this process.

Aerial photos picturing the 1989 study sites are provided in the proposed study plans. It has been 33 years since I last visited this area. These are not the study sites I remember walking to. Could the Licensee kindly check study records including survey records and confirm the photos correctly show the two 1989 study sites?

5.0 Background and Existing Information; "*The overall Project area supports a productive and popular sport fishery primarily for landlocked salmon and brook*

*trout, supported by both stocking and self-sustaining populations, primarily at the North Twin (impoundment and tailwater) and Millinocket Lake (impoundment and in Millinocket Stream) Developments".*

Current fisheries data for the Penobscot Mills Project area are limited to a MeDIFW winter angler survey and very limited gill nettings, thus these statements are unsupported. Pre 2022 data on the North Twin Tailwater fishery have not been provided and 2022 data is desperately needed. Thus, the status of that once important North Twin tailwater fishery is totally unknown and should not be referenced. The only brook trout fisheries in project waters are maintained by stocking as there are no significant self-sustaining brook trout population within the project boundaries. However, MeDIFW routinely stocks many waters both within and outside the project boundaries with hatchery brook trout. The case for yet another water with stocked brook trout and poor access is extremely weak. It is even weaker when source hatchery fish (Article 413) are unavailable in May.

7.0 Methodology

After being included in earlier sections, salmon are excluded from the study, only brook trout were referenced. The Licensee need to clarify the role of all landlocked salmon life stages. I requested that all salmon life stages be included in an earlier filing and MeDIFW made a similar request in its Revised Study Plan comments of February 22, 2022 (Appendix B).

As noted above, my only other comment is that macro-invertrabrates flow, depth and substrates requirements be added to the modeling event and that Hydrophyscid caddis be include as a study species (Family in this case).

In summary, for the last seven months I have read licensee and agency filings that are subjective at best. This an evidentiary proceeding. Simply because the licensee or MeDIFW makes a statement doesn't mean it is accurate. Many of these statements are not backed up with data or formal written policy. The licensee and to a lesser degree MeDIFW, need to provide facts e.g., data, policy, when they comment on fisheries and aquatic communities subject to a 30 year FERC License. I ask that FERC require the licensee and MeDIFW to provide supporting data, rather than subjective thoughts when contributing to this ongoing process.

Thank you for the opportunity to Comment

Ed Spear

307 Mt Hope Ave.
Bangor, ME  04401
Email: espear1@yahoo.com
Phone (207) 217-4288

Jesika Lucarelli, Millinocket, ME.
Jesika Lucarelli, owner/operator @ Great Mountain Guide Service

We are in favor and encourage flow studies be conducted so we may better understand the full potential and opportunities for Whitewater recreation between rip damn and McKay station, below Millinocket damn, and below the stone dam on Millinocket stream.
Our goal is to see adequate flow studies in these 3 reaches, done by professionals “on water” and not Have the study be conducted by testimony from the Internet. As a local guide service we support a new study for relicensing because the desire and need for recreational white water is in high demand. We want to see our local economy continue to benefit from the tourism attracted by these places. More accurate and up-to-date flow studies may result in the expansion of our businesses, and continued growth for local economy.

Ryan Reed, Kingfield, ME.
I am writing in support of recreational water releases for whitewater boating in the Ripogenus Dryway as well as Millinocket Stream. I am a member of American Whitewater and I fully support the comments submitted by AW and AMC regarding the Revised Study Plan. Creating more recreational opportunities in this area would be beneficial for both the whitewater paddling community and the local economy. Thank you for your consideration.

Benjamin Koehler, Orono, ME.
I am writing today both as an avid recreational user, and as an outdoors professional working on the rivers of Maine. The three sections that the Maine whitewater community would like to have flow studies for whitewater recreation are; The Dryway on the West Branch of the Penobscot, between Ripogenus Dam and McKay Station, Millinocket Stream, and the dewatered section of the West Branch of the Penobscot between Quakish Lake and Shad Pond.
The Dryway on the West Branch of the Penobscot is one of the most quality, continuous class 4-5 sections in the state. When paired with the Gorge Crib section downstream of the Dryway, it is hands down the best dam release whitewater in the northeast. This section of whitewater could be a huge economic and recreational asset to the nearby town of Millinocket, but currently no releases are scheduled for the Dryway, and when it does run Brookfield makes no effort to publicize the release. It is essential for the economy of the area that FERC orders Brookfield to complete a Whitaker style Whitewater Boating Flow Study on this section.
Millinocket Stream is a quality class 2-3 section that ends right in Millinocket, a town that is transitioning from an industrial economy to an outdoor recreation economy. Millinocket has great access to class 4-5 whitewater on the West Branch, but lacks a venue for beginner boaters to hone their skills. Having summer releases on Millinocket Stream would provide recreation for boaters of all skill levels, give local outdoor educators such as Outdoor Sport Institute a section to provide instruction, and be especially beneficial to local children who aspire to become competent boaters. It is essential for the economy of the area that FERC orders Brookfield to complete a Whitaker style Whitewater Boating Flow Study on this section.
The dewatered section of the West Branch of the Penobscot between Quakish Lake and Shad Pond has a short but quality class 3-4 gorge, and a beautiful waterfall. Currently next to no flow is sent down this natural river channel, as it is diverted into the hydro project at the Millinocket mill site. Putting water back into this river section would provide another great stretch of whitewater, right in Millinocket, and would provide a great intermediate step for improving boaters between Millinocket Stream and the West Branch. Brookfield alludes to a flow study that was done on this section last time licensing was done, however no one at Brookfield can locate the study. It is essential for the economy of the area that FERC orders Brookfield to complete a Whitaker style Whitewater Boating Flow Study on this section.
In conclusion, existing knowledge of these sections is anecdotal, and needs to be studied formally so that FERC can make an informed decision about the future of whitewater recreation in the Millinocket area.

Kimberly D. Bose
April 27, 2022
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426 Via Electronic Filing

Re: The Ripogenus and Penobscot Mills Projects P-2572 and P-2458

Great Lakes Hydro America's failure to meet 401 Water Quality Certification Articles and Protection, Migration and Enhancements Measures during 2021.

Great Lakes Hydro America (the Licensee) initiated the Licensing of the Ripogenus (P2572) and Penobscot Mills (P2458) Projects on June 8, 2021. During this process the Licensee has submitted numerous filings that demonstrate their failure to follow 401 WQC prescriptions. Additionally, the licensee has ignored measures suggested in the 1996 EIS and then listed them in the Preliminary Application Document (PAD) as Protection, Enhancement and Mitigations (PE&M) measures. The Licensee needs to be held to both legal standards and enhancement measures so often referred to in the PAD and subsequent filings. Stating that nothing has changed and "everything is great", simply is not supported by the March 23, 2022 "flow and elevation" filing and the Maine Department of Inland Fisheries and Wildlife's (MeDIFW) Chesuncook lake (Ripogenus Impoundment) October 8, 2021 filing. I contend that the Licensee needs to correct operating procedures that clearly violate 401 WQC articles or contradict PE&M statements made in the PAD. This filing requests that FERC immediately take the necessary actions to correct present and future operations that are impacting fish and aquatic communities and angler use and success in the Ripogenus Impoundment and all reaches of the West Branch. The areas of concern are;

- Article 402 – Ripogenus Project, Upper Gorge July-September 30 flows
- Article 406 - Ripogenus Project, Holbrook Bypass Channel Salmon Spawning and Nursery Flows
- Article 408 – Penobscot Mills Project, Irregular Flows
- Article 413 -Millinocket Stream, Spring and Fall Brook Trout Stockings

- The Use of the Water Management Plan

Upper Gorge:

Former MeDIFW Regional Biologist, Paul Johnson filed (October 8, 2021) comments on the PAD, noting that the licensee's present practice of providing surface flow into the Upper Gorge were not meeting the objective of Article 402, section 401 of the Clean Water Act. MeDIFW echoed this concern in its October 8, 2021 filing.

> "*It was the intent of MDIFW that the flows in the Upper Gorge would originate from a deep gate and provide a cool water attraction flow as adult salmon reached the upper river in July. However, the water is released from a sluice (surface) gate which is warm water. This water is warmer than the water passing through McKay Station into the river and is therefore ineffective as an attraction flow*."

Brookfield Renewable Energy/ Great Lakes Hydro America is a competent and well-run organization. During *due diligence* the Licensee surely became aware of goals and operating necessities required by License articles and PM&E measure presented in the 1996 EIS and the resulting FERC license. Still, despite complaints and study requests, the Licensee continues to ignore issues raised in numerous stakeholder filings and a very reasonable MeDIFW request has been ignored. However, this "pales in comparison" to the fact that the Licensee's lists the Upper Gorge flow as a PM&E measure when recent Upper Gorge flows are by surface discharge. The resulting flow act as a salmon repellent rather than an attraction flow. The existing Upper Gorge flow regime is exactly opposite of the MeDIFW request.

In recent years, the July 1 -September 30 period, flows into the Upper Gorge were 90 cfs of surface water though a "log sluice" gate. The assumption was that the remaining flow needed to meet the 100 cfs requirement was from leakage (12 Cfs recorded during a full pond 1991 measurement). However, the license says release. This implies an action, in this case, opening a gate. Leakage is passive and beyond control of the licensee and in fact, there are no current data reporting the amount of (any) leakage and change in (any) flow volume as the Ripogenus Impoundment head is reduced.

The present licensing schedule appears to be delayed and field collections are unlikely to be initiated by May 1, 2022. Another year's delay and another year of continuing impacts. During this transition period FERC can act to bridge the gap, by ordering the Licensee to either provide Upper Gorge flow through a deep gate or by requiring the Licensee to siphon off water (say 10-15 cfs) from below the McKay Station intake structure, say 55 feet below full pond elevation. Either method will reduce the Upper Gorge stream flow temperature. A return to the initial MeDIFW goal and conditions of Article 402 is a simple operation.

.Holbrook Bypass Channel:

The Holbrook Bypass Channel, Article 406, was designed at the request of MeDIFW in order to mitigate for the lack of young-of-the-year (YOY) salmon habitat in the West Branch below McKay Station. Two intake pipes were buried under a rocky berm along the northeast side of Holbrook Pool. One pipe with an adjustable valve, allowed for flows of 35 (June 1st) or 65 cfs (October). Mandated monitoring studies required in Article 406 and conducted during the years of "relatively stable base flows" determine that this mitigation measure was a success. Adult salmon spawned in the bypass channel and subsequent YOY production was excellent in earlier years. Monitoring studies ended in 2001.

During the summer and fall of 2021, low McKay Station flows resulted in reduced flow into the bypass area. On September 14, 2021 Licensee's staff photographed the upper Bypass Channel at a reported station flow of 1000 cfs (see the Licensee's September 30, 2021 filing). The two pictures show a flow that lacks surface turbulence and riffles, conditions needed for optimum YOY salmon production. Looking downstream from the intake gates, a long, flat stretch with an "unbroken" surface is apparent. Such waters are not suitable for YOY salmon and salmon production is lost or reduced under a 1000 cfs flow regime.

By November 2021, Holbrook bypass low flows became effectively no flow, and this very limited flow was not suited to spawning AND overwintering survival of eggs. The 2020 spawning year class and resulting 2021 salmon YOY production was lost during late summer and early fall low flow events. Then November 2021 salmon spawning was lost due to fall and (2022) winter dewatering, this will result in NO 2022 salmon YOY production. Two years of Article 406 mitigation lost and the West Branch salmon population will suffer in the coming years. While 2021 was a "dry

year", the Licensee was in complete control of Ripogenus storage and McKay Station Flow. On May 15, 2021 the Ripogenus Impoundment elevation was 933.77 (see March 23, 2022 filing) or about 23 BCF, the upstream Storage Project (P-2634) presumably in full license compliance, contained another 9 BCF. An additional 8+ BCF of inflow would eventually contribute to storage during the May 15-September 15 period. The resulting 40 BCF was enough water to meet both hydroelectric and PM&E measures. Instead, the Licensee chose to generate and drain the Ripogenus Impoundment, and eventually the West Branch, rather than meet PM&E measures so often cited in the PAD and subsequent filings. The FERC compliance section should require the Licensee to meet the WQC Article 406 condition as well PM&E measures it now boasts of so frequently.

Daily low evening flows e.g., 1000 cfs, not only impacted the above referenced salmon nursey area (both in the bypass and in downriver areas) but aquatic communities, fisheries and angling opportunity. The foundation of the 1992 Ripogenus Project License Application was "relatively stable base flows" and the accompanying "two wheel" (turbine) 2000 cfs flow when Mill energy demands were low. This was an environmentally proven mode of operation. The fishery below McKay Station was a "world class" fishery. MeDIFW referred to this river section as a "Destination Fishery". FERC now has an opportunity to protect the fish and aquatic insects below McKay Station by requiring the licensee to adhere to article 406 standards. Mandating McKay Stations discharges that provide a June 1st flow of 35 cfs into the bypass stream will meet multiple goals including downstream fish and aquatic communities' needs.

Penobscot Mills Project Flows

The 1996 License was based on Great Northern Paper's historical relatively stable West Branch base flow operations. It appears that the Licensee has changed from historical operations into a peaking mode in waters downstream of North Twin Dam and extending to the Medway Impoundment. For example, during August 12 and 13 of 2021, North Twin Dam outflows peaked at 3943 cfs before returning to the licensed minimum of approximately 2000 cfs (the Licensee's March 23,2022 filing). These peaking events appeared in other years and all other facilities. While well within the license WQC conditions, such flows are not "relatively stable" and impact fisheries and aquatic communities. The Licensee has yet to file the

requested hourly flow and elevation records for each facility. These records should be made public. A review of licensee' March 23, 2022 filing of *Daily operations data* listing "min.station" and "max.station" records indicate that there were numerous peaking flows events but the time frame is unknown. Minimum and maximum station flow differentials of 1000-1400 cfs were common below all facilities. FERC should require that the Licensee provide the requested hourly flow information, these data will demonstrate any daily flow fluctuations in response to energy demands.

During low flow periods, the West Branch provides much of the mainstem Penobscot River's flow, perhaps 90%. Thus, flow management of the West Branch (Penobscot Mills Project) impacts down river fisheries and aquatic habitat downriver of the Weldon Station (Mattacecunk Project P-2520). The entire mainstem Penobscot River below Weldon Station is considered critical habitat for the federally listed Atlantic salmon. The USGS West Enfield flow records, when viewed in graphical form, suggest upstream peaking events. The impact(s) of Penobscot Mills Project flow management on critical Atlantic salmon habitat in the mainstem Penobscot River should be considered.

Millinocket Stream, brook trout stocking

Article 413 requires *"The licensee shall implement an upgraded spring and fall brook trout stocking program to provide a seasonal fishery in Millinocket Stream. Each stocking shall consist of about 500 fish ranging in size from 1/3 to one pound,…."*.

Initially, Millinocket Stream hatchery brook trout were supplied by a private source rather than a public source, MeDIFW**.** A review of MeDIFW stocking records dating back to 2010 revealed that the licensee has been unable to meet Article 413 requirements in the last 11 years. The Licensee has consistently failed to meet the "spring and fall brook trout requirements" as spring stockings of trout "*1/3 to one pound*" have not occurred. The 2021 stocking of small, but catchable, 10 inch trout was an improvement but still failed to meet WQC Article 413 requirements. There were also a number of May stockings, when two inch fry were stocked. These efforts also failed to meet Article 413 requirements. Stocking brook trout fry in Millinocket Streams makes no biological sense. The reason for stocking brook trout fry is unclear. This alarming failure to meet an important

Article 413 mitigation measure was not revealed in any of the Licensee's frequent filings. I urge FERC to correct this licensee violation by requiring the Licensee to stock "*1/3 to one pound*" brook trout in the spring.

The Use of the Water Management Plan:

The Licensee has mostly ignored the 1996 Water Management Plan (WMP) and arbitrarily set up its own water management plan; a peaking operation driven by the market for electric power that conflicts with environmental needs. Circa 1990, Great Northern Paper hired highly credentialled Dr Nathan Burris PhD to develop a Water Management Plan that evolved into a Water Use Plan (WUP) for the West Branch drainage. The WUP was used in the early years of the current license but may have been abandoned by the Licensee. I say "may" because the licensee sometimes claimed to follow their own water management scheme while at other times referring to the WUP. The best and perhaps only example of "picking and choosing" water management guidance, the WUP, or using their own mysterious water management plan that ignores stated license goals is found in a footnote to Table 4.4-1 of the PAD;

*"The whitewater flow for each month from May through September is determined on the first day of each month based on an analysis of Total Available Water as described in the Water Use Plan in the application for new license filed with the Commission on December 17, 1991"*

There are no upper flow limit associates with "whitewater flow" releases. The March 23, 2022 flow spreadsheets demonstrate that during 2021, the Licensee routinely operated in a peaking mode, e.g., 3000 cfs, during periods before, during and after boaters were on the river. Market driven energy needs for peaking are simply called "Whitewater flows". MeDIFW questioned water management in its October 10, 2021 filing, questioning 3000 cfs flows during draught conditions. *"MDIFW observed on several occasions in the winter and summer of 2021 that the Licensee was indeed running in excess of 3,000 cfs when lower flows were required by the license;*". By August 2021 Ripogenus Impoundment storage was clearly being rapidly depleted and many PM&E measures threatened. Still the Licensee continued to operate in a peaking mode. The WUP, including "*an analysis of Total Available Water as described in the*

*Water Use Plan"* referenced in the PAD, was clearly arbitrarily ignored in the summer of 2021.

The PAD states that the licensee measures snow in late February/early March and uses the result to "manage" storage. The relevance of "snow depth" is not clear. The critical factor relating to potentially available storage, is water content in the snowpack. Equally bewildering, is the apparent lack of knowledge of the North Branch and South Branch (hydraulically controlled by the Canada Falls facility) USGS monitoring stations and the unwillingness to use real time inflow data. A review of the 2021 USGS North Branch station and to a lesser degree the (hydraulically controlled) South Branch Station flow data provides clear and irrefutable evidence that the Licensee violated the "or inflow" provision of the Ripogenus' s Project Article 406 during the late summer and early fall of 2021.

"*The 1991 Water Use Plan (i.e., the licensee's proposed operation alternative) was developed prior to issuance of the Projects' existing licenses and was the basis for the operational requirements included in the Projects' 1996 FERC Licenses. However, as compared to the Water Use Plan, the Projects' current operations are defined by the requirements of the Projects' licenses. Therefore, the 1991 Water Use Plan is not a "management plan" consistent with other management plans resulting from a relicensing proceeding"* (PAD 1-12).

The above quote is simply the Licensee's opinion. Other than the obvious change to a peaking operation (that the Licensee has yet to acknowledge), the Licensee provides no explanation of the above statement. I have seen no FERC filings where the Licensee has filed statements concerning abandonment of the FERC license guidelines. The change in operation was a deliberate business decision to maximize generation. In the PAD the Licensee states "*Therefore, the 1991 Water Use Plan is not a management plan consistent with other management plans resulting from a relicensing proceeding*." The WUP is the foundation of the 1996 Licenses. FERC, in the 1996 EIS, found the WUP compatible with existing fish and aquatic communities and "boating" needs while at the same time meeting other required PM&E measures. The Licensee implies nothing has changed but then states in the PAD that the WMP is no longer valid. So, what has changed to the degree that the WUP is not "consistent with other management plans"? The Licensee referenced water management frequently and boasted about it as a

PM&E measure. Thus, it is obvious that the Licensee has some type of a water management plan with starting and ending points. However, "generate and drain" is not a water management plan as the end points are a dry impoundment and an environmental disaster. It is time for the Licensee to share the parameters used in managing storage and flow in all project waters with the agencies, stakeholders and FERC.

It is time to develop a new Water Management Plan. MeDIFW in its October 8, 2021 filing echoed a similar sentiment, *"We view this upcoming relicensing process as an opportunity to review and fine tune the water management for the Ripogenus Project."* Simply stated, at this time, there is simply no peer reviewed water management plan for the West Branch for the West Branch between McKay Station and the Medway facility. In its frequent filings, the licensee constantly talks of water management and then demonstrates that none exist. It is obviously that in the case of fisheries, aquatic communities, loons, camp owners and boaters, their needs were not considered during 2021 and other years. The West Branch River system is out of balance. As soon to be mandated 2022-2024 studies are completed, a list of competing needs will be developed. In order to balance the needs of various users, FERC staff will require information on available storage and flow requirements. Without a peer reviewed water use plan, FERC staff's task will be impossible.

Despite the Licensee's warning of another "dry year" in its March 9, 2022 filing, heavy rains have greatly improved storage conditions and the impoundments are filling or already full. To those of us involved in this licensing(s), we are happy to see the Licensee enjoy an apparent (at this time) "wet year". Wet years are good for hydroelectric generation, and even better for fish and aquatic communities. A win for all parties. Still, environmental concerns remain. As an interim measure, I urge FERC to require that Holbrook bypass flows be maintained as envisioned by Article 406. This can be accomplished by ordering that minimum McKay Station operating flows be set between 2000 -2200 cfs. I also request that FERC implement MeDIFW's ramping request (October 8 2021 filing) of a 25% change per hour outflow below all project facilities. Ramping rates are common to all new FERC licenses/401 WQCs and the Licensee is required to ramp at Caucomgomoc Lake Dam (P-2634), Stone Dam (P-2572) Article 412 (7), and the Magpie River (Ontario, CA) to name a few facilities. A new license is at a minimum four years

away. The ongoing impacts to fish and aquatic communities needs to be corrected. Current project operations are out of balance, heavily skewed to power generation. Requiring the Licensee to adhere to the many license articles and PM&E measures it so often boasts of would be a good start.

Thank you for the opportunity to comment on the many license violations that resulted from Licensee's 2021 operations of the Ripogenus and Penobscot Mills Projects.

Ed Spear

307 Mt Hope Ave.
Bangor, ME  04401
Email: edspear1@yahoo.com
Phone (207) 217-4288

Brookfield
Renewable

April 27, 2022

***Via Electronic Filing***

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject: Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Response to Stakeholder Comments on Revised Study Plan**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), a subsidiary of Brookfield Renewable and Licensee of the Ripogenus Hydroelectric Project (FERC No. 2572) and the Penobscot Mills Hydroelectric Project (FERC No. 2458) (collectively referred to as the "Projects"), herein files with the Federal Energy Regulatory Commission ("FERC" or "Commission") responses and clarifications to select stakeholder comments on the Revised Study Plan (RSP) for the relicensing of the Projects. The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot Counties, Maine.

On June 11, 2021, GLHA filed the Notices of Intent and Pre-Application Document (PAD), which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through the Commission's Integrated Licensing Process (ILP). Subsequently, FERC issued Scoping Document 1 (SD1) on August 10, 2021, and held daytime and evening virtual scoping meetings on September 9, 2021.[1] Additionally, on the afternoon of September 9, 2021, GLHA hosted a virtual environmental site review. On November 22, 2021, FERC issued Scoping Document 2 (SD2). Also on November 22, 2021, GLHA filed a single Proposed Study Plan (PSP) for the Projects. GLHA hosted a two-day virtual PSP meeting on December 15 and 16, 2021. On March 23, 2022, GLHA filed a RSP for the Projects.

Via letter dated April 1, 2022, the National Marine Fisheries Service (NMFS) requested an extension of time to file comments on the RSP. Via letter dated April 7, 2022, FERC approved an extension of time until April 28, 2022, for stakeholders to file comments on the RSP and until May 13, 2022, for FERC to issue the Study Plan Determination for the Projects. Given these extensions of time, GLHA is providing clarifications and responses to select stakeholder comments regarding the RSP. GLHA believes that this additional information will provide stakeholders with additional needed information and support the Commission's development of the Study Plan Determination.

[1] As specified in SD1, the Commission did not conduct in-person public scoping meetings or in-person environmental site reviews due to concerns with COVID-19.

Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462
www.brookfieldrenewable.com
Tel: 207.723.4341
Fax: 207.723.3948

**April 1, 2022 Letter filed by American Whitewater and Appalachian Mountain Club (AW-AMC)**

**AW-AMC Comment on Whitewater Boating Assessment Study**

Specific to the West Branch Below Stone Dam, SD2 and the comments of AW, AMC and Maine Department of Conservation, Division of Parks and Public Lands on the PSP requested that the West Branch below Stone Dam be assessed to adequately evaluate the needs and opportunities related to this resource for whitewater boating and other recreation. In the RSP, related to Stone Dam in section 5.0, AW and AMC believe the licensee is seeking to justify their lack of interest in following the Whitaker 2005 methodology by arguing that flows needed for such an analysis cannot be provided. AW and AMC find this assertion to be unclear and inconsistent with other publicly available information related to the operating parameters of the Stone Dam.

Though the licensee claims that the inflatable flashboards that have replaced the old gate structures at Stone Dam prevent the licensee from conducting a controlled flow study in this reach, AW and AMC find this contradictory to filings on this project to the Low Impact Hydropower Institute in their application and the reviewer's report in that docket (https://lowimpacthydro.org/lihi-certificate-167-millinocket-dolby-hydroelectric-project-maine/). Regarding the Stone Dam inflatable structure, the LIHI docket notes that Stone Dam may be used to attain the 2,000 cfs minimum flow downstream of the Millinocket Project when the Millinocket project is offline. The LIHI docket notes that, "*During periods of high seasonal flows or whenever abnormal conditions occur such that turbine flow [at the Millinocket Project] cannot be passed to achieve the 2,000 cfs minimum flow, the pneumatic rubber flashboard system [at Stone Dam] is deflated to release flows in an expeditious effort. When this occurs, a two-minute siren warning is initiated and a safe flow of 200 cfs is released for fifteen minutes. Increases of 400 cfs per hour are made until either the required downstream flow is met, the elevation at Stone Dam falls to 459.45 ft msl or the pneumatic rubber flashboard system is fully deflated. The ramping down of flows in the Back Channel is initiated once turbine hydraulic capacity is restored or seasonal flows start returning to normal.*" Provided that this information is accurate, it appears that Stone Dam can be operated in such a manner to assess whitewater paddling with an on-water component as part of the study if deemed necessary after Whitaker Level 1 study through single flow or multiple flow on-water study. This should be corrected in the Study Plan Determination.

**GLHA Response**

GLHA has reviewed the above-referenced information from the LIHI docket regarding the operation of the pneumatic rubber flashboard system at Stone Dam and provides clarifying information herein.

GLHA notes that LIHI docket information is consistent with the Water Management Plan for the Penobscot Mills Project, filed for Commission approval on April 9, 1997. The plan had been prepared in accordance with License Articles 401, 402, 403, 404, and 408 and was approved by Commission order on September 3, 1997.

The pneumatic flashboard system at Stone Dam is operated in support of public safety and to address abnormal operations (e.g., unplanned outages). Whereas GLHA operates the pneumatic flashboard system as such, it should not be interpreted that sufficient control of flows from Stone Dam exists to support a controlled flow study.

Minimum flows are released from Stone Dam using a procedure that incorporates ramping to avoid public safety concerns associated with an abrupt increase in flows downstream of Stone Dam. To provide the approximately 200 cfs public safety ramping release from Stone Dam, the control center partially deflates the pneumatic flashboard system. Prior to and during this deflation, the control center sounds the public safety siren for 6 minutes to notify downstream users of the increased flow entering the stream channel. During the public safety ramping release, the control center also observes via cameras the water flowing over the pneumatic flashboard system for the 15-minute duration to visually verify the deflation and estimated flow.

While the pneumatic flashboard system has a general gate discharge curve associated with it, the system, unlike pneumatically actuated gate systems, does not deflate consistently and, as such, does not release precise outflows. Although the pneumatic flashboard system at Stone Dam cannot release precise outflows, it is manually adjusted (as there is no automatic control) by the control center to maintain a stable head pond in compliance with the Penobscot Mills FERC license. As a result, the pneumatic flashboard system at Stone Dam is not capable of consistently providing the precise or sustained flows necessary for conducting a controlled flow study in this reach.

**AW-AMC Comment on Recreation Study**

Though AMC and AW appreciate the inclusion of a recreation user intercept surveys in the study methodology, we request that the study methodology also include an online survey, input from a stakeholder working group, and key person interviews with organizational representatives from user groups, representatives of camp owners and other recreation related interests, such as outfitters. It is not practical for our organizations or, for example, a camp owner on one of the lakes, rivers, or upland areas to be expected to travel to a FERC-approved recreation site to complete the survey, nor does the survey instrument speak to the feedback of these audiences as a broader representation of the needs, opportunities and issues that would be brought forward by these audiences.

**GLHA Response**

GLHA would like to clarify that the proposed study includes an online version of the recreation user survey. The survey boxes that GLHA will be deploying at each of the Project recreation sites will be displaying a QR code which, when scanned with a cell phone, can be used to find an online version of the recreation user survey. This method has been used effectively at numerous other hydropower projects and is a good way to provide online access to the survey.

Regarding the availability of the recreation user survey (or the QR code to complete the survey online) by those accessing the Project impoundments from locations other than the Project recreation sites, GLHA notes that the recreation user survey is focused primarily on understanding how the FERC-approved Project recreation sites are being used, and whether the facilities and amenities provided at the sites are functioning well and meeting their intended purpose. For this reason, it is appropriate to provide the surveys and QR code for online survey access at the Project recreation sites. That said, in their comments on the RSP, the Bureau of Parks and Land (BPL) asked how users of the remote campsites will be surveyed. To address this concern, GLHA will work collaboratively with BPL to install additional survey boxes at the boat launch locations indicated by BPL that are primarily used to access the remote campsites on the Ripogenus impoundment.

**April 7, 2022 Letter filed by Maine Department of Environmental Protection (MDEP)**

**Comment on Fish Assemblage Study**

In its comments on the Proposed Study Plan, the Department requested a Fish Assemblage Study that would be used to demonstrate, in part, whether the Projects meet applicable water quality standards. Specifically, the impounded waters must support all species of fish indigenous to those waters. The results of the Fish Assemblage Study would also be used as evidence that could demonstrate attainment of the designated use of habitat for fish and other aquatic organisms.

In the RSP, Great Lakes does not adopt the Department's requested Fish Assemblage Study, and instead proposes to conduct a Fishery Assessment as part of the Impoundment Aquatic Habitat Assessment component of the Water Quality Study. The Fishery Assessment would not involve any scientific sampling of fish populations. Instead, it would rely on existing information and interviews with various parties.

Although Great Lakes did not directly address the Department's request in its rationale for not adopting the Fish Assemblage Study, it did address a similar study request from a stakeholder group. Great Lakes appears to base its decision not to adopt the Fish Assemblage Study on its assertions that existing information is sufficient [section 5.9(b)(4)], that study results are not likely to inform potential license conditions [section 5.9(b)(5)], and that the study methods proposed by the stakeholder group (gill netting) are not consistent with generally accepted practice in the scientific community [section 5.9(b)(6)].

The Department disagrees with Great Lakes' assertions. First, existing information would not be sufficient to demonstrate that the Projects are currently meeting water quality standards. Historical and anecdotal data could be useful for fisheries managers, but it is unlikely to provide sufficient, defensible data for the Department to determine that the Projects' currently support all indigenous species of fish. Comprehensive, scientific sampling of fish populations would provide sufficient data to draw conclusions about the Projects' effects on water quality [section 5.9(b)(4)]. Second, the results of a Fish Assemblage Study would directly inform potential conditions that the Department could require in any Water Quality Certification it would issue for the project. Study results would be used to demonstrate attainment of

water quality standards related to fish populations in addition to providing evidence that the Projects meet water quality standards related to aquatic habitat more generally. If evidence of nonattainment is found, the Department will use the study results to inform the development of measures to mitigate for the Projects' effects on water quality. This is critically important to the relicensing proceeding, because FERC must include Water Quality Certification conditions in any new licenses for the Projects [section 5.9(b)(5)]. Third, the Department did not provide specific methods in its request since this type of study is commonly conducted in many FERC relicensing proceedings. Great Lakes' response focused on their concerns with the stakeholder group's proposed methods for collecting fish samples (gill netting). Great Lakes did not discuss any other generally accepted, and more commonly used, practices that the scientific community typically uses in fish assemblage studies, such as electrofishing. Due to this omission, Great Lakes' response did not fully address the study criteria, nor does it provide a basis for Great Lakes to not adopt the Department's requested study [section 5.9(b)(6)]. For these reasons, the Department requests that FERC determine that Great Lakes must complete a Fish Assemblage Study.

**GLHA Response**

To demonstrate that the Ripogenus Project meets applicable water quality standards, GLHA proposed in the RSP to complete additional data review and meet with regional Maine Department of Inland Fisheries and Wildlife (MDIFW) biologists who have current, first-hand knowledge of the existing Chesuncook Lake fishery to identify and describe indigenous species that are known to occur. In addition, GLHA proposed a macroinvertebrate study at the Ripogenus impoundment and aquatic habitat studies at the North Twin and Millinocket Lake impoundments to determine if aquatic life standards are supported in the Project areas. GLHA did not propose aquatic habitat assessments for the Millinocket (Quakish Lake and Ferguson Pond), Dolby, and East Millinocket impoundments because they are operated in run-of-river mode, which does not result in impoundment drawdowns under normal operations; MDEP typically does not require impoundment aquatic habitat studies for projects operated in run-of-river mode.

As described in the RSP, indigenous fish species known from the region include brook trout, yellow perch, white sucker, rainbow smelt, longnose sucker, lake whitefish, lake chub, golden shiner, fallfish, creek chub, common shiner, burbot, brown bullhead, and blacknose dace (Lakes of Maine 2022[2]). Most of these species are common throughout Maine waters. As described in Table 5-4.3 of the PAD, GLHA has previously documented that the Ripogenus impoundment supports these indigenous game and non-game fish species. The Licensee collected 18 species of fish in the Ripogenus impoundment as part of the last relicensing, including all known indigenous game and non-game fish species.

GLHA notes that the MDIFW, the principal state resource agency responsible for fisheries management and monitoring, did not request site-specific fisheries studies given the considerable

[2] Lakes of Maine. 2022. Database of Maine Lakes. Online [URL]: https://www.lakesofmaine.org/index.html?r=1650984792. Accessed April 14, 2022.

body of knowledge and their overall understanding of the fish assemblage in the Ripogenus Project area. MDIFW noted in its comments on the PAD (October 8, 2021) that there is an "*extensive history of inland fisheries studies associated with the Ripogenus Project completed in preparation for the 1996 license, and these studies need not be duplicated unless there are identified data gaps, or changes in operation that may impact the fisheries resources*." MDIFW also noted that the "*inland fisheries management goals for the Ripogenus impoundment and river have not changed since the last license was approved*."

In addition to the fisheries information collected during the previous relicensing effort, MDIFW has indicated that there is additional existing information on fishery resources in Chesuncook Lake of the Ripogenus impoundment that demonstrates the waterbody continues to support the indigenous fish species. GLHA spoke to the MDIFW Regional Biologist responsible for fisheries management at the Ripogenus Project on April 15, 2022, to discuss the fishery assemblage in Chesuncook Lake. During the call, MDIFW conveyed again that they have a good understanding of the Ripogenus impoundment fish community, and that there are more recent data (e.g., creel angler data and fish stomach content data) that can demonstrate the impoundment supports the indigenous fish assemblage. The following is a brief summary of the discussion with MDIFW during the April 15th conference call:

- MDIFW has a good understanding on species composition in Chesuncook Lake and is comfortable with the information that is available.
- No exotic species are known to occur.
- MDIFW offered to generate a species list from recent and past angler creel data (1,000s of hours of fishing records) that will document indigenous game and non-game species.
- MDIFW may have information from stomach content analysis that could supplement the species list.

On April 25, 2022, MDIFW provided additional data to GLHA consisting of raw data and a summary of data collected from the Ripogenus Impoundment between 1996 and 2021. The data summary provided by MDIFW is provided as an attachment to this letter.

Consistent with the approach that GLHA proposed in the RSP, GLHA will continue to work collaboratively with MDIFW staff to obtain and understand the existing fisheries data available for the Ripogenus impoundment. Additionally, GLHA will process and evaluate the raw data provided by MDIFW and provide a detailed summary of the data in the ISR to demonstrate the current make-up of the fish community.

GLHA's approach to compile and review existing contemporary data and work with MDIFW regional biologists to document that Chesuncook Lake continues to support the indigenous fishery assemblage, along with the proposed macroinvertebrate study in Chesuncook Lake and the aquatic habitat studies at the North Twin and Millinocket Lake impoundments, is a reasonable

and logical approach to determining if the structure and function of the waterbodies in the Project area are maintained.

Existing data from the previous licensing process, more contemporary data (e.g., MDIFW creel data), and professional input from MDIFW biologists will allow GLHA to document that the indigenous species assemblage in Chesuncook Lake is supported without the need for comprehensive, labor-intensive, and costly baseline fish assemblage studies throughout the Project area requested by TU and MDEP.

GLHA also notes that although electrofishing and other netting methods (e.g., seining, trap-netting) are common techniques for sampling shallow, near-shore habitats, it is unlikely that these methods (recommended by MDEP) will capture deep water or pelagic fish species (e.g., lake trout and lake whitefish), so they will only confirm the presence of common, near-shore fish species such as perch, minnows, and fallfish, which are already known to occur.

**April 7, 2022 Letter filed by Maine Council of Trout Unlimited (TU)**

**Comment on Stranding Evaluation Study**

TU submitted study requests for two types of studies: a Ripogenus Flow Excursion Study and a series of Fish Assemblage Studies correlating to the reaches described in the Pre-Application Document. In its Proposed Study Plan (PSP), Brookfield stated the Historical Operations Data and Assessment Study would document any such deviations from project minimums; however, the proposed study did not account for the stranding study component of our requested Flow Excursion Study. Accordingly, TU proposed a Stranding Evaluation Study in its PSP Comments.

**GLHA Response**

GLHA's rationale for not adopting the TU-requested Stranding Evaluation Study is consistent with that provided in the RSP in response to the Ramping Study requested by Mr. Ed Spear. GLHA believes that information collected and reported from other proposed studies, such as the Historical Operations Data Assessment Study, will provide information on how the Ripogenus Project has been operated, including flows provided by McKay Station. Additionally, fieldwork to be performed in the West Branch below McKay Station for other studies will provide additional information regarding flows in the West Branch in relation to aquatic resources.

Concurrent with this filing, GLHA is providing a copy of this letter to all parties listed in the attached distribution list, which can also be downloaded from FERC's eLibrary system at https://www.ferc.gov/docs-filing/elibrary.asp by conducting a search using the docket numbers p-2458 and/or p-2572.

If you have any questions regarding this letter, please contact me by phone at (207) 775-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman
Licensing Manager
Brookfield Renewable

Attachment: Summary of MDIFW Fish Data for Ripogenus Impoundment

cc: Distribution List

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

## Federal Agencies

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Stephanie Carman
Acting District Manager
Northeastern States
Bureau of Land Management
626 E. Wisconsin Avenue, Suite 200
Milwaukee, WI 53202-4617

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Kimberly Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Deborah Szaro
New England Region 1
Regional Administrator (Acting)
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Kenneth Hogan
North Atlantic-Appalachian Region Hydropower
Program Coordinator
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03301

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

## State Agencies

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and
Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and
Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and
Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Kyle Olcott
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
101 Second Street
Hallowell, ME 04347

## Municipalities and Government Officials

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Dr. Annette Padilla, PhD
Interim Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
4 Gabriel Drive, Suite 3
Augusta, ME 04330

Jeffery Gifford
State Representative
346 Frost Street
Lincoln Center, ME 04457

Peggy Jo Stanley
State Representative
413 Turnpike Road
Medway, ME 04460

## Native American Tribes

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Marla Dana
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

## Additional Parties

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Stephen Perry
Representative
Carpenters Health and Safety Fund

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Kelly Maloney
Manager
Great Lakes Hydro America LLC
150 Main Street
Lewiston, ME 04240

John Dicentes
President
International Association of Machinists
64 Congress Street
Millinocket, ME 04462-1312

Robert Farrington
International Brotherhood of Fireman
HCR 86, Box 195
Medway, ME 04460

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Director
Maine Professional River Outfitters
PO Box 669
Millinocket, ME 04462-0669

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Bill Houston
Board of Directors
National Wildlife Federation

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Allison Economy
Representative for Allagash Gateway Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Thomas Nannery
Sportsman's Alliance of Maine
RR 1 Box 1174
Augusta, ME 04330-9801

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Jeffrey Reardon
Maine Brook Trout Project Director
Trout Unlimited
267 Scribner Hill Road
Manchester, ME 04351

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Jeff Fayle

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris

Kathy Houston
58 Mystery Road
Kingfield, ME 04947

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Charles Paone

Richard Parkes

Ed Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Robert Van Deventer

Wes Zemrak
2 Brookside Drive
Falmouth, ME 04105

**Summary of MDIFW Species Data from Chesuncook Lake**
**1996 to 2021**

**IFW Clerk Surveys (completed by our staff)**

Winter: We conducted winter clerks surveys in 8 years during the period 1996 – 2021

Summer: We conducted summer clerk surveys in 4 years during the period 1996- 2021

Data summary all years/all seasons:

Total Angler days: 1,821

Total Angler Hours: 10,444

| Species | # Reported (all sizes) |
|---|---|
| Brook Trout | 25 |
| Cusk | 222 |
| Fallfish | 70 |
| Lake Trout | 13 |
| Landlocked Salmon | 2087 |
| Lake Whitefish | 7 |
| Smelt | 390 |
| Splake | 20 |
| White Perch | 300 |
| Yellow Perch | 355 |

**Summary of MDIFW Species Data from Chesuncook Lake**
**1996 to 2021**

**Voluntary record book data**

Winter: We have data from 24 years during the period 1996 – 2021

Summer: We have data from 23 years during the period 1996- 2020

Data summary all years/all seasons:

Total Angler days: 2,777

Total Angler Hours: 15,523

| Species | # Reported (all sizes) |
|---|---|
| Brook Trout | 28 |
| Cusk | 87 |
| Fallfish | 64 |
| Lake Trout | 22 |
| Landlocked Salmon | 6,318 |
| Smelt | 7 |
| Splake | 32 |
| White Perch | 3,474 |
| Yellow Perch | 171 |

MDIFW Age and growth data – These are fish that our staff have handled during creel surveys. They are typically measured, weighed, scale samples and a subsample of stomachs taken.

| Species | # Examined | Mean Length ( mm) | Ages represented |
|---|---|---|---|
| Brook Trout | 4 | 352 | 2-4, 6 |
| Cusk | 17 | 501 | |
| Lake Trout | 7 | 711 | 8,10,17 |
| Landlocked Salmon | 428 | 405 | 3-8 |
| Splake | 19 | 415 | 3-6 |

**Summary of MDIFW Species Data from Chesuncook Lake**
**1996 to 2021**

Food Habits data – Stomach samples are taken during winter clerk surveys. Food items are identified, enumerated, and volumes measured by displacement.

| Species with Stomachs Examined | # examined |
|---|---|
| Brook Trout | 4 |
| Lake Trout | 16 |
| Landlocked Salmon | 376 |
| Splake | 7 |

Food items identified in stomachs

Smelt

Unid. Fish Remains

White Perch

Old Hooks

Insects

White Suckers

Frogs

Unid. Minnow spp

Rocks

Vegetation

**Summary of MDIFW Species Data from Chesuncook Lake**
**1996 to 2021**

**Notes**:

Brook Trout – Population is limited by competition by warm waters species such as white perch, yellow perch, fallfish, and suckers. Brook trout are present in the lake but not abundant. Likely abundant in the tribs.

Cusk: Abundant

Fallfish: Abundant

Lake Trout: Fishery was maintained through a stocking program. Stocking was terminated in 1994.

Landlocked Salmon: Abundant

Lake Whitefish: We are not clear on the status. They do not show up in the winter clerk surveys. If they were abundant, we would expect to see them. Anglers have reported them, but they may be misidentified round whitefish or, most likely, fallfish. The last lake whitefish IFW sampled were in 1970 during a gillnetting operation. Seventeen were taken that ranged in size from 415-520 mm.

Smelt: Present. Although not as abundant as in past years, the population is still considered stable. Anglers that target smelt are successful and smelt are commonly found in salmonid stomachs.

Splake: Splake occasionally drop downstream from Ragged Lake and Deer Pd into the Chesuncook System. Considered incidental.

White Perch: Abundant

Yellow Perch: Abundant

White Sucker: Abundant

April 27, 2022

Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

RE: Comments on the Revised Study Plans for Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458) from Kathleen K. Houston

Dear Secretary Bose,

The following comments on the RSP are being submitted after review of the Operations data, in general support of agency study requests with the goal of helping FERC commissioners understand the need for requested studies. Careful analysis of the Operations Data clearly illuminates why agencies and NGO's have requested various studies. The data proves operations are vastly different than under the past licensing and studies are needed to understand the impact of the changes.

**Comments on 1-2 Description of Water Use Plan in relation to Existing Licenses**

The applicant describes: "*current operations are defined by the requirements of the Projects' licenses. Therefore, the 1991 Water Use Plan is not a "management plan" consistent with other management plans resulting from a relicensing proceeding. The one exception being that the Water Use Plan is used as the basis for determining recreational flows from McKay Station at the Ripogenus Project. As indicated in Article 402 of the Ripogenus License*, "*The recreational flow for each month from May through September shall be determined on the first day of each month. This determination shall be based on an analysis of Total Available Water, as described in the Water Use Plan"*

If "recreational flow for each month" is determined on the first day of the month, logic dictates that Recreational Flows during a dry hydrologic year, as defined by the license, would be adhered to. Instead, from June 1, 2020 to September 1, 2020 more water was released than required by the licensee every single day. Most days the release was 500cfs more. Many days the release was as high as 1000 cfs more. The operations data provided does not tell us if the amount of time the excess water was released, but one can assume it was beyond required time parameters as well. The same pattern is seen in 2018 when the lake was two feet down Memorial Day, and more water than required was released every day of the summer but three,

with August 31st finding a lake fourteen feet down. Similar patterns are seen in other years. With this much excess water being released in drought and non-drought years, a logical conclusion is that the fisheries and wildlife are being negatively impacted. Requested studies will help determine the status of aquatic life.

**Comments on 1-3 Description of Mitigation Measures Implemented Pursuant to Existing Licenses**

It must be noted these mitigation measures were required by the past license issued nearly 30 years ago, based on data at that time. It cannot be assumed these mitigation measures have had the intended impact without further study.

The mitigation measures needed in 1996 to "offset impoundment fluctuation" was minimal compared to current impoundment fluctuations. In the 1996 application, the applicant stated, *"Current operations of the Ripogenus impoundment results in annual water level fluctuations of as much as 44 feet. Since 1972, the maximum draw-down during the summer recreation period (between Memorial Day and Labor Day) has been 15.25 feet**: the average has been 3.5 feet (3.10.4.1).**"*

In the last 10 years, **the average drawdown** on Ripogenus, Caribou and Chesuncook lakes on August fifteenth **has been: 8.48 feet**. More than double than at the time of the previous licensing. Maximum drawdowns have been near 20 feet. This vast difference clearly illustrates the difference between the lake environment in the two applications and thus the need for the studies requested by agencies. Following license requirements negotiated before current management of the project does not preclude current, thorough studies.

**Mitigation claims that are unsubstantiated "on the ground"**

Claims conflicting with what is experienced "on the ground" cannot be deemed accurate and thus need further study.

· Claim*: Installation and enhancement of recreation facilities pursuant to the license, for which periodic monitoring was performed (every 6 years through the existing license term) of recreation facility use.*

At the Chesuncook boat landing a kiosk and a bathroom were installed and are well maintained by BPL staff. The boat launch has not been maintained in many years. In 2020, we placed a call to Brookfield requesting the boat launch at Chesuncook Lake be improved as it was unusable by mid-August. The woman we spoke with promised it would be fixed next spring. Nothing was fixed in the spring and the boat launch continued to deteriorate. A Recreational Inventory that also evaluates the quality of launch substrate is necessary.

Claim: *Deployment of artificial nesting platforms for loons and aquatic birds, for which 12 years of monitoring was performed (1998-2010).*

Loon platforms have been found out of water, some broken, along the vast shoreline in different locations and times of year.

**Comments on the Common Loon Management Plan Study**

The Maine Department of Inland Fisheries and Wildlife (MDIFW) recognizes the significance of the loon and formally requested a study to evaluate the Common Loon Management Plan. As the table below illustrates, the applicant's RSP objectives are very different from those of MDIFW.

| **MDIFW Requested Study Objectives** | **GLHA Proposed Study Objectives** |
|---|---|
| *1. **Assess** the use of rafts by loons at the Ripogenus impoundment.* | *1. **Summarize** the results of the loon nesting surveys performed in 1998 and 1999 at the Ripogenus Project* |
| *2. **Evaluate** loon/nesting success under the plan.* | *2.**Summarize** the results of the annual loon nest monitoring surveys performed between 2000 and 2010 at the Ripogenus Project* |
| *3. **Determine** if Project operations, particularly during low water years, are impacting loon nesting success and if new strategies need to be incorporated into the plan."* | *3.**Summarize** specifics as to how the existing loon management plan has been implemented over the term of the existing license* |
| | *4.**Evaluate** the existing information in relation to historic impoundment elevations at the Ripogenus Project* |

The focus of the "objectives" in the applicant's proposal is to "summarize" past data, some of which is over 20 years old. It is concerning summaries, and subsequent analysis and evaluation has not already taken place. How these summaries will meet the requested proposal "to evaluate loon/nesting success," particularly under operating conditions since 2010, is not clear. It is also unclear how "evaluating existing information in relation to impoundment elevations," as proposed, will happen as the summaries are from data before 2010 and the impoundment data shared begins in 2010. The proposed methodology after 2010 is simply to "*summarize the annual procedures from 2011-2021."* There appears to be little connection between the proposed methodology and the requested objective of: "*determine if Project operations, particularly during low water years, are impacting loon nesting success and if new strategies need to be incorporated into the plan."* Please ensure the study objectives from the MDIFW are met, as they are designed to truly evaluate loon success.

The applicant's proposed study plan goals, *"to summarize existing information collected over the term of the existing license related to loons at the Ripogenus impoundment including specific information on how the existing loon management plan has been implemented over time at the Project, which will be used to inform an updated loon management plan **anticipated to be implemented at the Ripogenus Project** over the term of the new license."* are also of concern.

The language "anticipated to be implemented" is alarming. It is imperative a new loon management plan be developed and monitored under the new license. Leaving the door open to not have to do so could be damaging for Maine's iconic loon.

**Comments on 1-4 Recent Hydrology and Effects on Project Conditions**

Claim: *"Although GLHA has implemented water conservation measures at the Projects since the current severe drought conditions began in 2020, including reducing hydro generation at the Ripogenus Project, the current low natural inflows (in combination with the required minimum flows at the Ripogenus Project and the water level and minimum flow requirements at the downstream Penobscot Mills Project) have affected Ripogenus impoundment elevations, particularly during the late spring through fall period*."

Water conservation efforts may have taken place, but these claims fail to acknowledge the impact of water releases beyond license requirements while blaming "*required minimum flows at the Ripogenus Project,*" for impoundment elevations. As previously stated, releasing significantly more water than required by the license every day of the 2020 recreational season, rendering the lake ten feet below full by July 31st, is not water conservation. The data does not give us hourly flows, but we know from the anecdotal data of people living on the river, that there were many nights in the summer of 2020 and 2021 that the river was very high, even raftable, at night. In 2021, the applicant was aware of the drought, and knew the lake was already eight feet down on Memorial Day, yet still released more water than required by the license nearly every day. As a result, at the end of the summer the lake was 17 feet down. Subsequently, GLHA later asked for a minimum flow variation giving full responsibility for this request to the drought or flow requirements downstream.

The past licensee was able to maintain those lake levels without dewatering Chesuncook, Ripogenus and Caribou lakes. The applicant can also control the outflow at downstream bodies of water to meet those lake level requirements. Drought, minimum flow requirements or recreational releases are not the sole cause of extreme lake fluctuations. Excessive water release is a major factor. Every year since 2010 shows a pattern of more water being released than required by the license. In 2010 everyday in August saw releases of over 3500 cfs, when only 1800-2300 is required. As a result, by August 31st, the lake was 13 feet down. It is unfathomable that this does not negatively impact the fish, and entire lake and river ecology. It most certainly negatively impacts recreational use of the lakes. The same is true for 2018 as well as other years. Hourly data would be even more enlightening.

It is as if the applicant considers these "impoundments" commercial wells, in which the faucet can be turned on at will. At most times operations are following the license, which indicates the previous license was developed under vastly different circumstances and the impact must be studied. Power generation must not come at the expense of the fish, the wildlife and the entire ecosystem of the waterways. Agency requested studies are necessary to evaluate the impact of these current operations, which are so very different from those of the past applicant.

The applicant seems to be clinging to the past license and laurels of past project operations, which, as has been repeatedly stated, was issued under a completely different set of economic and environmental circumstances. The paper mill is gone, there are many more camp owners on

the lakes, eco-tourism is the basis of the economy. The great potential of whitewater recreation on the economy of the region must be studied. Millinocket and the surrounding areas need the economic benefit of the recreational opportunities afforded by the lakes and rivers. An economic study, as requested by the Penobscot Nation, would inform a necessary understanding of the socioeconomics of the region, and help ensure current and future economics, as well as non-developmental interests are understood and given balanced consideration in a permit.

Ripogenus dam is no longer being run to provide energy to the mill. It is being run essentially as a peak power plant. A great variation from the 1996 license. Yes, the Ripogenus project provides renewable energy, which is greatly needed. However, the energy produced is not the only source of renewable energy available, and the dewatering of the third largest lake in Maine is too great a casualty. The upcoming license is not a recertification. It is a completely new license and needs the in-depth requested studies to support it.

The local Brookfield representatives understand the dynamics of the lakes and rivers and their importance to the local culture and economy and strive to work with community members. Their efforts are greatly appreciated. Working with them, I firmly believe a balance can be struck that preserves the fisheries and lake quality, provides hydropower, meets the interests of the whitewater community, and stabilizes lake levels for camp owners and recreational users. To achieve this balance, the requested studies need to be completed for a thorough understanding of the socioeconomic, fisheries, wildlife and recreational impacts of current operations so a permit that best balances all stakeholder interests can be achieved.

Thank you for your time and consideration.
Sincerely,

Kathleen K Houston
khlally14@gmail.com
PO Box 145
Kingfield, ME 04947

-

April 27, 2022

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**RE: Analysis of flow data and Relevant Comments on the Revised Study Plan for the Ripogenus (FERC No. 2572) and Penobscot Mills (FERC No. 2458) Hydroelectric Projects**

Dear Secretary Bose:

On March 23, 2022, Great Lakes Hydro America, LLC (GLHA) filed the Revised Study Plan (RSP) for the Ripogenus Hydroelectric Project (FERC No. 2572-133) Penobscot Mills Hydroelectric Project (FERC No. 2458-247). The RSP contained daily operations data from 2010 to 2021 for each of the projects including impoundment surface elevations and daily discharge for the project's power stations. We note that this data was provided four months after the Federal Energy Regulatory Commission's (FERC) November 28, 2021 deadline for providing this information.

On March 31, 2022, the National Marine Fisheries Service (NMFS) requested that the Commission grant the agencies and stakeholders an additional 60 days to file comments on the revised study plan in order to review 10 years of flow data that was submitted concurrently with GLHP's revised study plan. On April 7, 2022, FERC granted the agencies and stakeholders an additional 21 days to review the flow data and submit comments on the revised study plan (deadline of April 28, 2022).

While we appreciate GLHA providing this data and FERC's extension of time to review this data, in our March 31, 2022 request for flow data we had also requested hourly flow data downstream of each generation facility in the Penobscot Mills and Ripogenus projects. Hourly flow data would allow us to fully understand how each of these projects are being operated on a daily basis, and potentially identify the effects of these operations on aquatic resources. We continue to contend that this data is readily available to GLHA as evidenced by the March 10, 2022, letter to FERC where GLHA submitted hourly flow data at McKay Station for September 7, 2021. Therefore this information should still be provided to fully understand how these projects are being operated. Despite not receiving hourly flow data, we have analyzed several aspects of the data and offer the following observations for FERC's consideration.

Appendix A to this letter provides an analysis of flow profiles (in cubic feet per second (CFS) per square mile to normalize flows/discharge by drainage areas) obtained from the North Branch Penobscot flow gauge compared to the flow profiles through Ripogenus and the Penobscot Mills projects. The North Branch Penobscot is a major, unregulated tributary of the West Branch,

representing a natural flow regime. A run-of-river hydroelectric project in the West Branch would have a flow regime similar to what is observed at the North Branch Penobscot flow gauge. Figure A1 compares the North Branch Penobscot flow profiles to the Ripogenus flow profiles from 2012 - 2021. Figure A2 illustrates 5 years of representative flows through Ripogenus, North Twin, Dolby, and East Millinocket. Figure A3 illustrates 5 years of representative flows through the unregulated portion of the North Branch Penobscot. Together, these data show very consistent, but very different, flow profiles through the unregulated portions of the West Branch compared to the heavily regulated portions of the West Branch. In summary, this analysis reveals that Ripogenus Dam flattens the flow profile and removes most of the discharge variability in the West Branch; this lack of variability is reflected at each of the projects downstream. The loss of flow variability subsequently dampens any disturbance flows, bankfull discharge flows, or channel forming flows that play a crucial role in the health of riverine ecosystems. Riverine organisms and ecosystems, including the feeding, migration, spawning and rearing behaviors of sea-run fish, have evolved around seasonal flow variability that are more synonymous with the flow profile of the North Branch Penobscot. Loss of flow variability puts native species, including sea run fish at a disadvantage to species that are better adapted to stable flow profiles, including invasive smallmouth bass. We expect that FERC will fully consider these effects in its NEPA analysis.

Appendix B to this letter compares project operations with required minimum flows for both recreation and aquatic resources. In their March 9, 2022, letter to FERC, GLHA states that water conservation measures were implemented at the Ripogenus and Penobscot Mills projects due to ongoing drought conditions in the upper Penobscot River watershed. On March 4, 2022, GLHA implemented reduced minimum flows (to 800 cfs at Ripogenus, and to 1,000 cfs at the Millinocket Development, part of the Penobscot Mills Project) to conserve water. However, our analysis of daily project operations data indicate that GLHA was not, in fact, consistently conserving water at the projects from 2019 to 2021 in response to drought conditions. In the figures below, we analyzed flow releases at McKay Station, impoundment elevations at the Ripogenus Project impoundment, and inflows from the North Branch of the Penobscot River. We also chart aquatic and whitewater minimum flows as currently required in the Ripogenus Project license. Taken together, it is obvious that GLHA was generating the McKay power station to provide flows well in excess of the required minimum flows for significant periods throughout 2019, 2020, and 2021 despite low lakes levels in Ripogenus Project impoundment. Neither increased nor reduced generation at McKay Station mirrored inflows from the North Branch of the Penobscot River (USGS No. 01027200 North Branch Penobscot River near Pittston Farm, ME). It would appear that GLHA was conserving water to increase generation at other times of the year. The current mode of operating the Ripogenus and Penobscot Mills Project is certainly impacting fisheries and aquatic resources in the Penobscot River watershed. We urge FERC to consider this information in making a decision to require our requested IHA study for the Ripogenus and Penobscot Mills Project. Note the recreational flows shown in the figures in Appendix B (MIN FLOW: recreation) represent the highest hourly minimum flow requirement for each day of the whitewater rafting period.

**STUDY PLAN RECOMMENDATION**

Specific to this flow data, and based on the limited data that we have received and our analysis of this data, we contend that FERC should require, at a minimum, an Indicators of Hydrological Analysis (IHA) (Study Request 1 in NMFS October 8, 2021 letter) to evaluate the effects of the Penobscot Mills and Ripogenus projects on the hydrology in the West Branch of the Penobscot River, as well as the mainstem Penobscot River downstream to the estuary. Operation of the projects on the West Branch affect the timing and magnitude of flows in the mainstem Penobscot River and may affect the physical and biological features of the Migration Primary Constituent Element of designated critical habitat for the endangered Gulf of Maine distinct population segment of Atlantic salmon (74 FR 29300, June 19, 2009). The results of this study will be used to establish baseline hydrologic conditions, project monitoring and assessment, development and analysis of alternatives for proposed project hydrology, potential mitigation measures, and planning additional instream flow studies as part of this relicensing. The objective of this study is to characterize metrics of hydrologic alteration due to project operational effects and then identify target flows and impoundment levels using the RVA method.

In addition, we are reiterating our request for hourly flow data downstream of each generation facility in the Penobscot Mills and Ripogenus projects. As we have stated previously, all parties to this relicensing must have a precise understanding of the mode of operating the Ripogenus and Penobscot Mills projects to identify potential effects to environmental resources in the project areas.

If you have any questions or need additional information, please contact Dan Kircheis (Dan.Kircheis@noaa.gov) or 207-866-7320.

Sincerely,

Julia E. Crocker

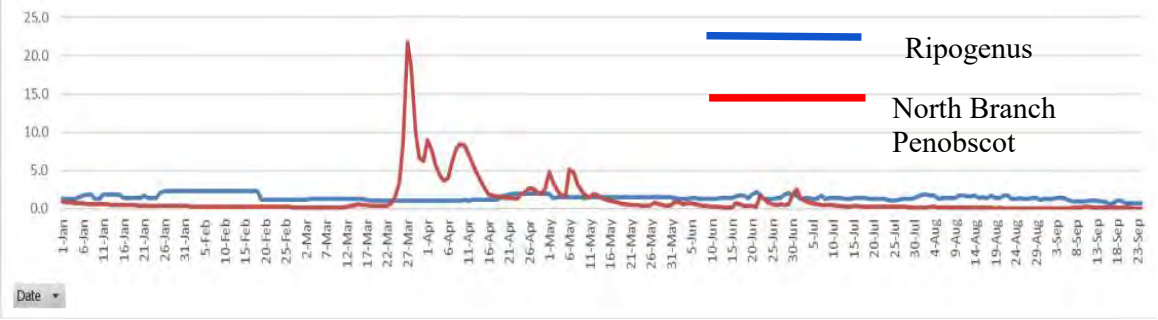
Julie Crocker
ESA Fish, Energy, and Ecosystems Branch Chief

cc: Service List

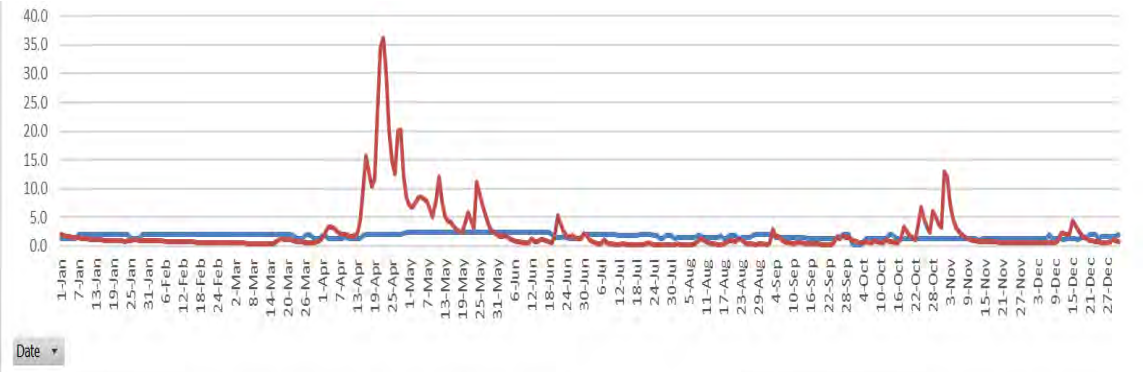
**APPENDIX A:**

Figure A1: Flow comparison (CFS/sq. mi) of the unregulated North Branch Penobscot showing natural disturbance regimes compared to the heavily regulated flows at Ripogenus Dam (2021-2012)

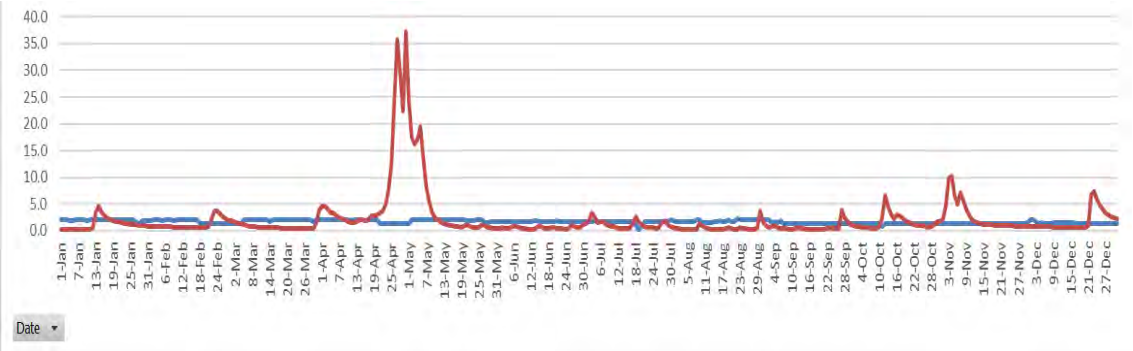
2021



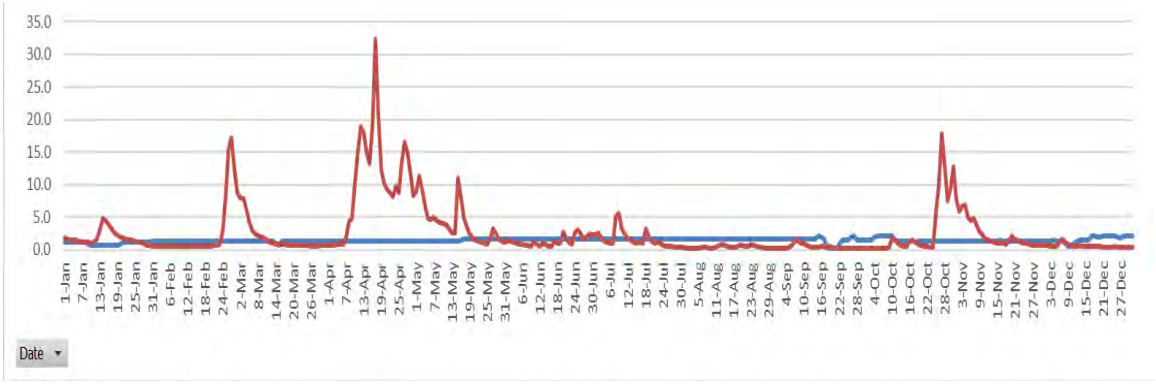

2020



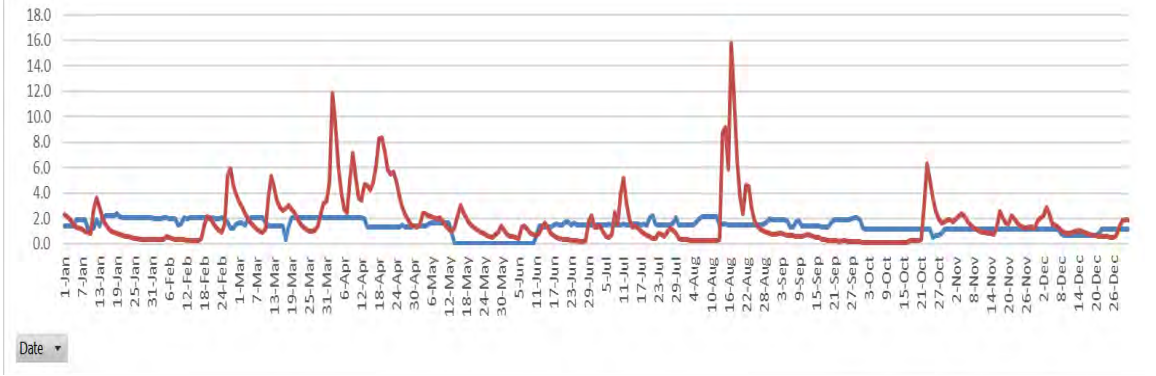

2019



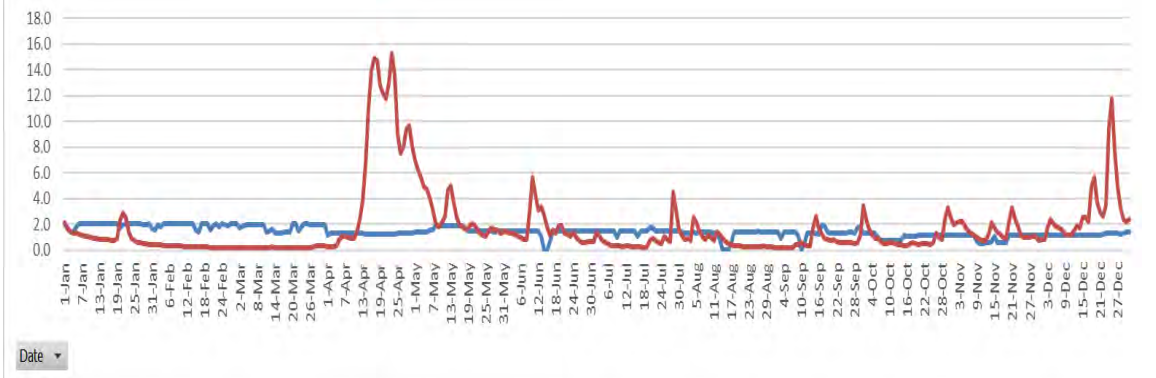
2018



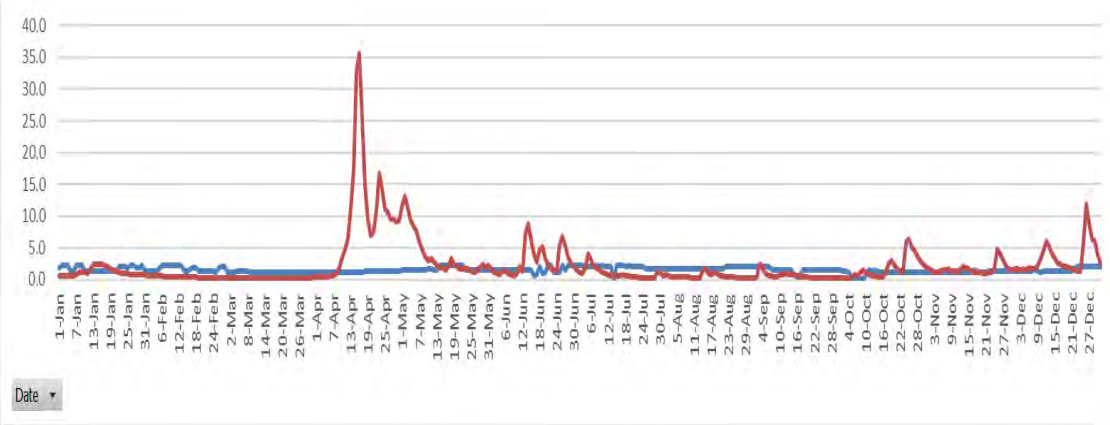

2017



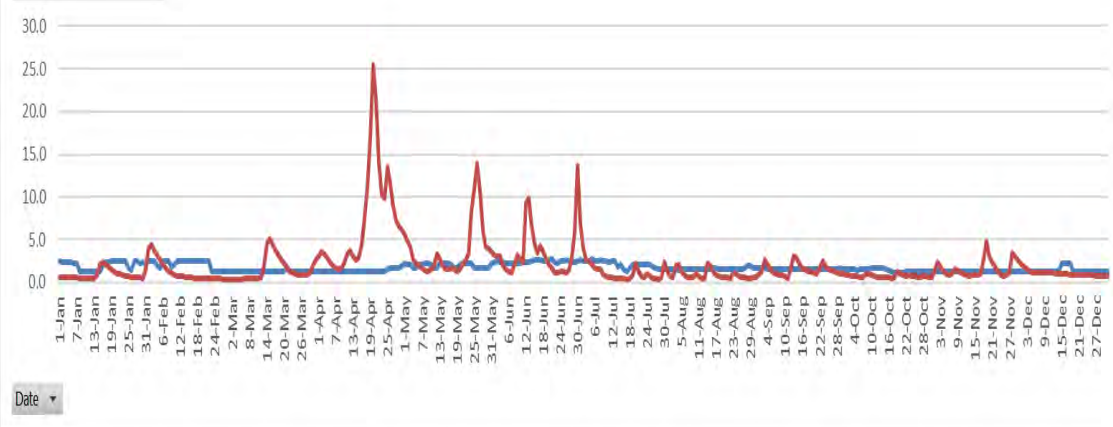

2016



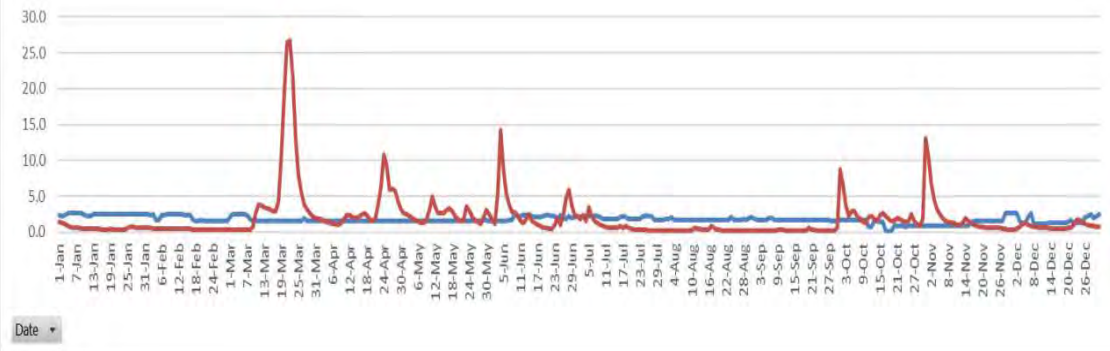
2015




2014




2013



2012

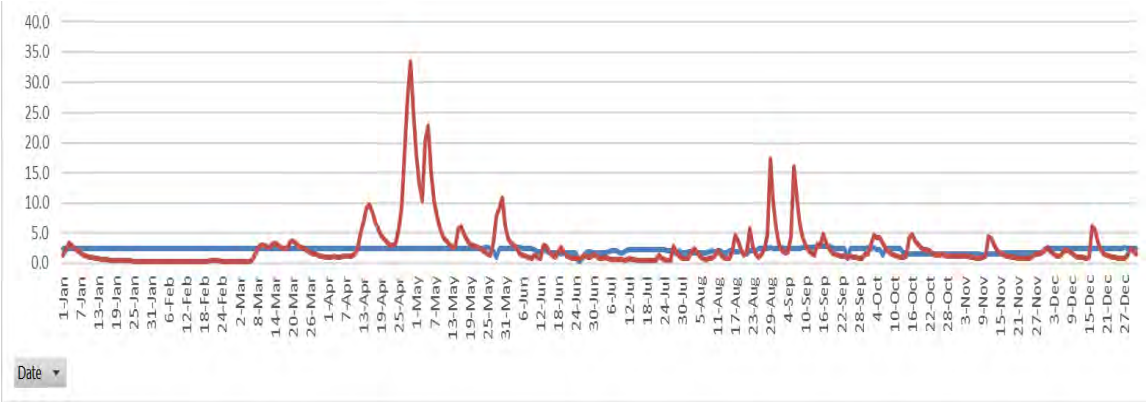
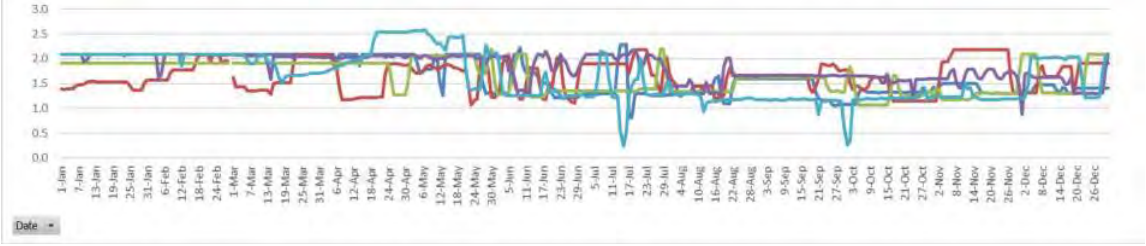



Figure A2: 2016-2020 flow profiles (CFS/sq. mi) for Ripogenus, N. Twin, Dolby and East Millinocket

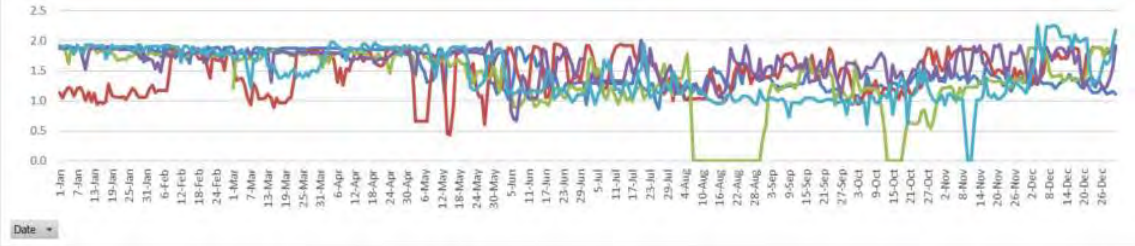
Ripogenus




N. Twin



Dolby




E. Millinocket

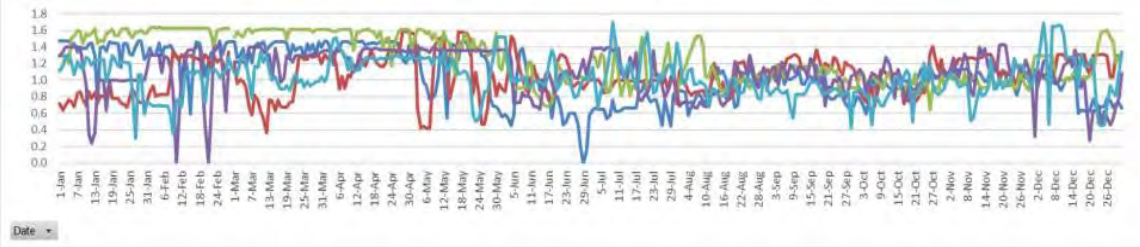
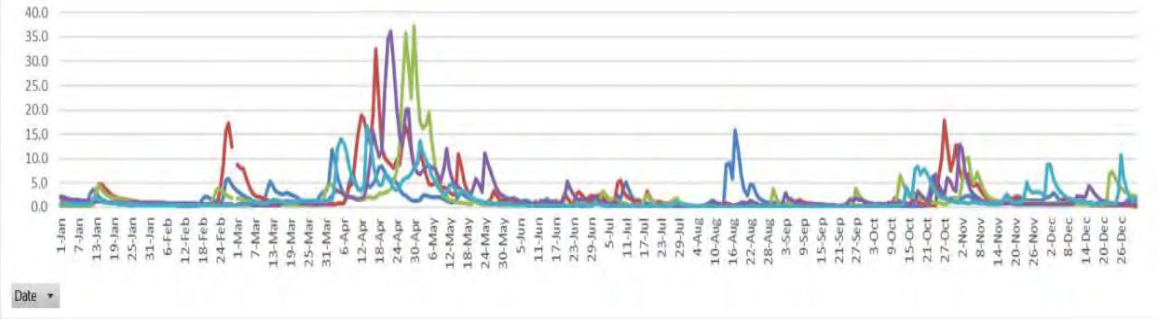
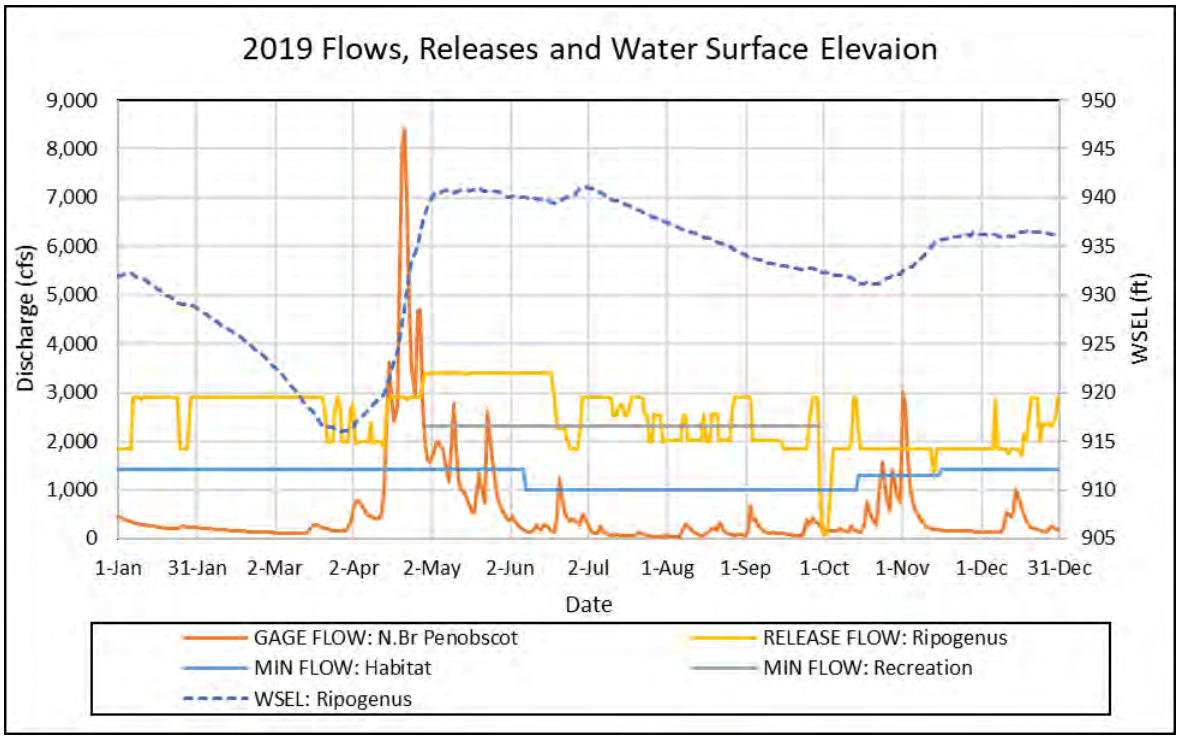


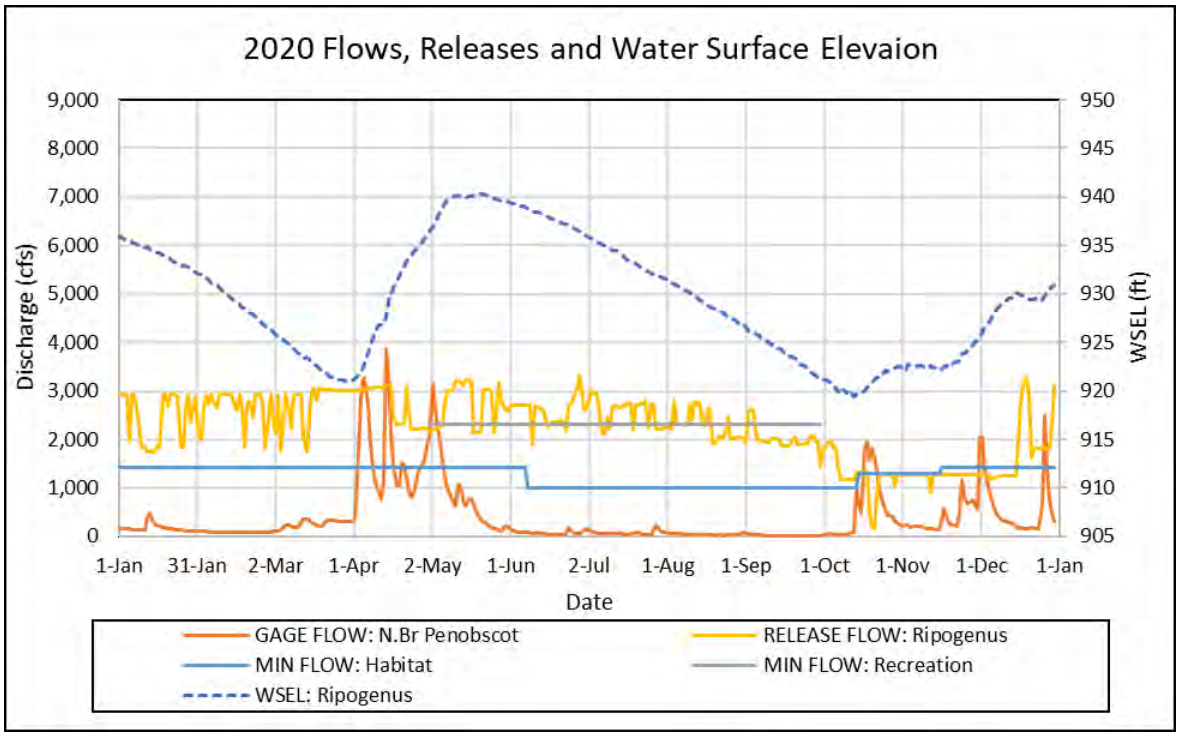

Figure A3: 2016-2020 flow profiles (CFS/sq. mi) at the N. Branch Penobscot flow gauge showing high seasonal flow variability and much higher unit runoff in the spring.

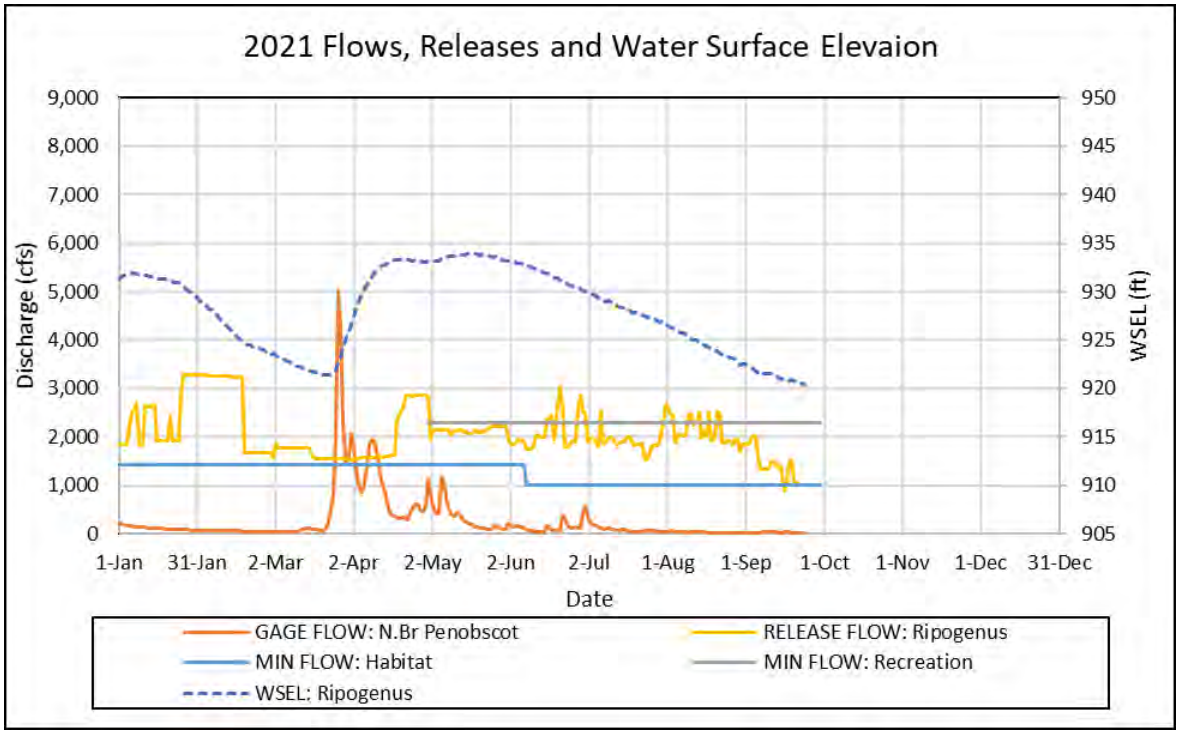
N. Branch Penobscot (Unregulated)



**APPENDIX B:**


2019 Flows, Releases and Water Surface Elevaion
Discharge (cfs)
WSEL (ft)
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
950
945
940
935
930
925
920
915
910
905
1-Jan
31-Jan
2-Mar
2-Apr
2-May
2-Jun
2-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec
31-Dec
Date
GAGE FLOW: N.Br Penobscot
RELEASE FLOW: Ripogenus
MIN FLOW: Habitat
MIN FLOW: Recreation
WSEL: Ripogenus


2020 Flows, Releases and Water Surface Elevaion
Discharge (cfs)
WSEL (ft)
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
950
945
940
935
930
925
920
915
910
905
1-Jan
31-Jan
2-Mar
1-Apr
2-May
1-Jun
2-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec
1-Jan
Date
GAGE FLOW: N.Br Penobscot
RELEASE FLOW: Ripogenus
MIN FLOW: Habitat
MIN FLOW: Recreation
WSEL: Ripogenus


2021 Flows, Releases and Water Surface Elevaion
Discharge (cfs)
WSEL (ft)
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
950
945
940
935
930
925
920
915
910
905
1-Jan
31-Jan
2-Mar
2-Apr
2-May
2-Jun
2-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec
31-Dec
Date
GAGE FLOW: N.Br Penobscot
RELEASE FLOW: Ripogenus
MIN FLOW: Habitat
MIN FLOW: Recreation
WSEL: Ripogenus

Alexander Kerney, West Boothbay Harbor, ME.
My name is Alex Kerney. I'm a current resident and was born and grew up here, and came back after going to college away. I've been puttering around in boats since I was little, and whitewater kayaking for 15 or so years now, including 5 or so years teaching kids to paddle for the Chewonki Foundation on the West Branch and other rivers around the state and beyond.

These days I send a lot of my free time when I'm not paddling, helping to develop trails and ski glades in the Mahoosucs, and volunteering on a search and rescue team (Mahoosuc Mountain Rescue Team) that has recently added swiftwater rescue to our complement of skills, though I am not representing the team or Chewonki, just myself.

The dryway between Rippogenous Dam and McCay station is a pretty distinct section of whitewater from my experience. While I've tried to paddle it multiple times, I've only gotten a few laps on it as most of the times I've shown up to find the water just having been shut off, so my experiance of the dryway at a range of flows is no where near complete. Because of this, I support American Whitewater's request that on water flow studies are completed on both the dryway and other sections of the West Branch of the Penobscot system.

Cory, Weare, NH.
I lived and worked on the west branch of the Penobscot. In addition to being a kayaker and raft guide on the penobscot , I teach college whitewater kayak courses in the state of Vermont for UVM and NVU. I believe the west branch would benefit tremendously if the were scheduled recreational releases on the millinocket stream a great town run and the Dryway a fantastic expert section  to add to the already quality gorge crib section. This area is a absolutely gold mined of opportunity for teaching whitewater. I have had the opportunity to paddle the Dryway at many different flows from 300,  1000, 1500, 2500, 3000, 6500 cfs and levels in between. This run is very unique for it encompasses a large gorge that was mostly lost in the building of the RIP dam. The Dryway is the last part of the gorge that should be restored. I think these recreational releases are what this area needs to show it’s full potential as a whitewater destination for the people and for the community.

Doug Kranich, Millinocket, ME.
The flow in Millinocket Stream needs to be sufficient for navigating personal watercraft and for fishing. For the past several years, it has been so low that both activities have been compromised. The flow needs to be at a sustainable rate to enjoy this amazing resource within the town of Millinocket. Thank you for listening to my concerns.

Gregory Friel, Millinocket, ME.
Millinocket Lake Dam and Penobscot Mills Relicensing

I would like to comment on the stream flows in Millinocket Stream as part of the relicensing process. I am a Registered Maine Guide, k-12 Outdoor Education Instructor and Physical Education Teacher. Millinocket Stream has been and should continue to be a great resource for the town of Millinocket as well as the local schools. One of my big concerns over the last 5-10 years is a steadily lowering water flow through late spring, summer and fall. It has been impossible to paddle a kayak or canoe down the stream just north of town, through town ending in town at Krandall Park, a gentle paddle and nice fishing trip, normally. I have used this stream for the Outdoor Education Class that I teach at Schenk H.S. for fly casting, canoeing, both swift water in the spring and flat-water paddling and poling inst. in the fall for the past 20 years. We also participate in a partnership paddling project with the University of Maine's Outdoor Leadership Class for a learning experience for our 9-12 Outdoor Education class and our grade 4 students from Opal Myrick Elementary School in East Millinocket. UMaine's Outdoor Leadership Class teaches our students safety and fundamentals of canoeing, a great experience we would love to be able to continue with some kind of consistent flows. The last 5-10 years the flow has lowered to around 80 cfs, not enough to float a boat of any type 150-200 cfs is an awesome and usable level. It would be nice if a usable flow would become the practice that is used to be so the schools and town could take advantage of a great renewable resource and bring it back to what is used to be. Maybe the practice of pumping water across to Ambajejus Lake could be changed to send more water into Millinocket Stream for the sake of recreational and educational opportunities as well as for the wellbeing of the natural resources ( fish, wildlife, plants, ecosystems ect.) Thanks for any consideration you will give to the youth of the Katahdin Region.

Jacob H Risch, Madison, NH.
My Name is Jake Risch, I've grown up spending summers exploring the woods and waters of Northern Maine. As a child, I learned how to paddle a canoe in the headwaters of the East Branch, and later honed my whitewater kayaking and raft guiding skills on the mightly West Branch.

Over the last 25 years, My paddling career has led me to complete whitewater trips and expeditions to 17 countries on four continents, earn a Maine Whitewater Guides license, start a volunteer Swiftwater Rescue Team (the White Mountain Swiftwater Rescue Team), and found a whitewater-based safety and instructional company (Sawyer River Group). Our company currently offers Swftwater Rescue Training on the West Branch.

I'm writing as a business owner with an interest in expanding our offerings in the Millinocket region, as a public safety (swiftwater rescue) expert, and as an avid recreational user of the West Branch Corridor in support of continued recreational flows on the west branch below McCay Station, in support of American Whitewater's comments on flow studies and methodologies for the Dryway section between Rippogenous Gorge and McCay Station, for Millinocket Stream, and for the "Backbend" reach of the west branch near Millinocket.

The West Branch corridor is already a special place for the Maine whitewater community. The addition of these reaches will transform the area into a world-class whitewater destination. Each of the proposed additional scheduled releases add unique characteristics that round out the recreational whitewater offerings of the Millinocket region.

Scheduled releases on Millinocket stream provide an ideal instructional run that will enable reliable beginner and intermediate whitewater courses and swiftwater rescue training sites that are more accessible to town. The backbend section builds the variety of in-town whitewater.

Finally, adding scheduled whitewater releases on the dryway section below Rippogenous Dam to the run below McCay station creates a world-class grade IV/V whitewater run that will incentivize whitewater enthusiasts from around the country (and world) to travel to the region. Those of us who have grown up on the waters of the West Branch appreciate its variety and quality. The one theme I've heard from whitewater boaters from outside of Maine looking for Class IV/V whitewater is that it's a long way to drive for a short section of expert whitewater. A scheduled release on the dryway solves this problem. I predict that this addition could create a draw similar to that of the whitewater releases in upstate NY on the Moose, Raquette, and Beaver rivers. The festivals and races that have emerged as a result of those scheduled releases have become significant economic drivers in similarly rural communities in Northern New York.

Brookfields proposed flow study methodology is not rigorous enough to determine the optimal flows for the diverse user groups that would be drawn to these reaches. A more formal study with an on-water component will provide the data necessary to

maximize the recreational and economic utility of these resources

Joyce P. Smith, MILLINOCKET, ME.
I am commenting on behalf of natural science education. As a local science teacher, I and other science instructors, along with outdoor educational leaders use the local waterways for educational purposes. We use hands-on techniques for instruction in entomology, canoeing, kayaking, fly fishing, and ecosystem sustainability.

When the CFS in our local waterways runs below 150 (as it has been the last few years in Millinocket) we cannot use them for teaching. The learning ceases to exist other than in the form of watching a video or reading an article. The water levels are too low to paddle and are ultimately causing a disturbance to fish and wildlife that is quickly destroying habitats.

Without our children having the opportunity to participate in these activities, we are leaving the future of our ecosystem sustainability to a generation of children who will not understand the importance of preserving the natural way of life that their parents and grandparents hoped to preserve for them.

Jessica Sterling, Bingham, ME.

My name is Jessie Sterling. I've grown up in and around the New England area. A retired runner and sports enthusiast , I've been active all my life. But it wasn't until my late 20s that I found whitewater, or rather it found me. Most people who know me already know this story. I was running a 5k in Portland ME, after which at a craft brew festival I saw an ad for Kennebec Brewing and Whitewater rafting. An odd combination if ever there was one, that was my perspective then so naturally it caught my attention. I ear marked it to look into further.

Not long after I was in a terrible accident that left me wheelchair bound for a short time. After a multi year recovery process that required multiple surgeries, I remain permanently handicap but not incapable. Kayaking became a major contributer to my recovery. The community welcomed me with open arms, they supported me and turned what could have been the worst time in my life into the best. Kayaking brought me back into myself. Whitewater Kayaking made me feel alive and capable of concuring everything. Now in my late 30s, I'm a team paddler for Pyranha Kayaks and Level Six. I compete in steep creek and down river kayak races. I teach beginner to intermediate whitewater kayaking and playback basics. I have kayaked throughout areas of North and South America, but there is no place like home. The West Branch is where I kayaked my first class V rapids, it's where we spend our weekends every summer.

As an instructor I believe, scheduled releases on Millinocket stream provide the opportunity to give beginner and intermediate instruction necessary to reduce entrancw barriers into the sport.
As a paddler and member of the community, adding scheduled whitewater releases on the dryway section below Rippogenous Dam creates a world-class grade IV/V whitewater run that will incentivize whitewater enthusiasts from around the country (and world) to travel to the region. We've seen consist increases in tourism in towns and other areas where they have made changes in support of the whitewater community having reliable flows to kayak on. I encourage you to see the work recently done in Franklin NH, in upstate NY. Allowing consistent access to both of these waterways helps everyone

mary haley, Skowhegan, ME.
Good afternoon,

My name is Mary Haley, I am the CEO of a Skowhegan-based marketing agency with regional coverage of central and Northern, Maine—including the Katahdin and Millinocket area. I am also a Maine Whitewater Guide and private whitewater boater using Brookfield management areas consistently.

My marketing agency specializes in tourism, hospitality, and economic development marketing. We work in rural regions promoting tourism and assets for residents and visitors. We have extensive experience in economic development projects aimed at revitalizing low-income areas.

As I'm sure you are aware, one of Maine's focuses for economic prosperity and revival is tourism and outdoor recreation. Tourism is one of Maine's top revenue generators and provides hundreds of thousands of jobs. Outdoor recreation, specifically, has become a state-wide focus with the creation of the Office of Outdoor Recreation and Maine recently ranked as having the fourth largest outdoor recreation industry in the country.

I am writing in support of continued scheduled releases for whitewater rafting and kayaking from McKay Station. These releases are non-negotiable for the continued existence of one of Millinocket's biggest tourism draws—whitewater rafting and kayaking. The whitewater rafting industry trickles down to benefit all, including, gas stations, hotels, grocery stores, restaurants, Airbnbs, etc. The benefits of this industry is not isolated to direct users only.

In addition to continued releases from McKay Station, I am submitting my support for scheduled releases from Ripogenous Dam for increased use on the Dryway (the gorge above McKay Station) and Millinocket Stream. These releases will increase the area's positioning as an outdoor recreation Mecca, offering more options for river users of all disciplines and skill levels.

I appreciate Brookfield's willingness for a flow study but I would add that the study needs to go beyond an evaluation of current data. Climate change has made our winters more volatile and unpredictable creating conditions that can have harmful implications for commercial outfitters and private users. New and additional data needs to be collected to evaluate these risks properly. A new flow study would also provide the opportunity to reevaluate flows and sections of the river previously deemed unsafe (e.g. the Dryway) or of no value, thus disqualifying those areas from scheduled flows required for use.

Thank you for your time and consideration. I hope my input and expertise provide valuable insight into the FERC process.

Mary Haley
CEO, MXH Marketing

Matthew Melcher, Bingham, ME.
My Name is Matt Melcher, I grew up in Bingham Maine and have been an avid whitewater kayaker for 25 years.
I am writing as an avid recreational user of the West Branch Corridor in support of continued recreational flows on the west branch below McCay Station, in support of American Whitewater's comments on flow studies and methodologies for the Dryway section between Rippogenous Gorge and McCay Station, for Millinocket Stream, and for the “Backbend” reach of the west branch near Millinocket.
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Brookfields proposed flow study methodology is not rigorous enough to determine the optimal flows for the diverse user groups that would be drawn to these reaches. A more formal study with an on-water component will provide the data necessary to maximize the recreational and economic utility of these resources

April 28, 2022

Ms. Kimberly D. Bose
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Via online submission to: http://www/ferc.gov (cross-filed)**

**Subject**: Comments of Maine Professional Rafting Outfitters on the Revised Study Plan for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458)

Dear Secretary Bose:

These comments on the Revised Study Plan (PSP) for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) filed for Great Lakes Hydro America, LLC by Brookfield Renewable ("Brookfield") are submitted by and on behalf of the members of Maine Professional Rafting Outfitters ("MEPRO"). MEPRO is an unincorporated association of commercial whitewater rafting companies that operate in and around the Penobscot River and all other major rivers in Maine.

Recreation Study

- The study should consider both commercial and public recreation for all licensed areas. In particular, the study should recognize the differences between commercial and non-commercial recreation and the needs of each user group, so these differences can be addressed in any mitigation action taken in the licensing process.
- The study should consider the local communities' renewed reliance on the commercial recreation and tourism industries following the closure of two large, nearby mills. If recreation opportunities in the area were disrupted by the Projects, the local economy would suffer greatly.
- The study should assess recreational facilities in all licensed areas, in order to support proper maintenance or enhancement of these facilities.
- This study should consider wetted width figures based on different flow regimes.
- The study should consider all major tributaries of the Penobscot River, including Millinocket Stream.
- This study should consider minimum and maximum flow based on average conditions, with provisions for hydrologic emergency conditions.
- This study should consider Ripogenus Lake and other impoundments in the system as water storage and reservoir projects, and not as natural lakes.
- Road access to the Project sites for commercial and public recreation must be protected and assured. Furthermore, if Brookfield owns or controls that road access, access should be made available without a fee for commercial and public recreation.

Whitewater Boating Assessment Study

- The study should consider both commercial and non-commercial whitewater boating for all licensed areas. In particular, the study should recognize the differences between commercial and non-commercial whitewater boaters and the needs of each user group, so these differences can be addressed in any mitigation action taken in the licensing process.
- The study should recognize that whitewater boating involves multi-day recreation and should include an assessment of overnight camping areas and the sanitation facilities associated with these camping areas, in order to support proper maintenance or enhancement of these areas and facilities.
- This study should consider minimum and maximum flow based on average conditions, with provisions for hydrologic emergency conditions.
- This study should consider wetted width figures based on different flow regimes.
- This study should consider Ripogenus Lake and other impoundments in the system as water storage and reservoir projects, and not as natural lakes.

Controlled Flow Whitewater Boating and Access Study

- MEPRO supports the Controlled Flow Whitewater Boating and Access Study as proposed by American Whitewater and the Appalachian Mountain Club. This study should consider minimum and maximum flow based on average conditions, with provisions for hydrologic emergency conditions.
- This study should consider Ripogenus Lake and other impoundments in the system as water storage and reservoir projects, and not as natural lakes.
- This study should consider wetted width figures based on different flow regimes.

Water Quality Study

- This study should consider Ripogenus Lake and other impoundments in the system as water storage and reservoir projects, and not as natural lakes.
- This study should consider minimum and maximum flow based on average conditions, with provisions for hydrologic emergency conditions.
- This study should consider wetted width figures based on different flow regimes.

Marsh Bird Survey Study and Furbearer Survey Study

- Both of these studies should consider wetted width figures based on different flow regimes.
- Both of these studies consider Ripogenus Lake and other impoundments in the system as water storage and reservoir projects, and not as natural lakes.

Socioeconomic Study

- MEPRO supports the Socioeconomic Study proposed by the Penobscot Indian Nation. The closure of the remaining paper mills in the area since the last licenses were issued

has changed the local socioeconomic conditions radically, renewing local reliance on the commercial recreation and tourism industries. The Socioeconomic Study is necessary to assess the effects that changing the local commercial recreation conditions through these Projects would have on local communities.

Request for Carbon Sequestration Study

- MEPRO requests a Carbon Sequestration Study to assess the carbon output of mixed or fossil fuel replacement energy in the event the Projects were removed.

Request for Wetted Width Study

- MEPRO requests a Wetted Width Study to assess wetted width figures based on different flow regimes.

MEPRO appreciates the opportunity to comment on these Projects.

Respectfully,

/s/ Joseph Christopher

Joseph Christopher
Spokesperson
Maine Professional Rafting Outfitters

Robin Nesbeda, ANDOVER, ME.
Maine has a long history of outdoor recreation. Our wilderness/outdoor recreation environments stand-up to better-known (and profitable) areas in other parts of the nation (like the rivers and mountains around Golden, CO). And these activities need not detract from hydro-electric generation. Flow studies can help gather better data for meeting all interests!

One other thought: as a paddler, there need not always be larger releases. More consistent lower-releases can appease paddlers/rafting companies. Consistency matters more than periodic high-volume.

Thank you for your time and consideration!!

Kimberly D. Bose May 5, 2022
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426 Via Electronic Filing

Re: The Ripogenus Project P-2572, Great Lakes Hydro America April 27, 2022 Filing; The Licensee's Response to Stakeholder Comments on Revised Study Plan

Great Lakes Hydro America (the Licensee) continues to attack reasonable requests for much needed fish and aquatic communities studies with legal references and data irrelevant to the issues at hand. As in recent filings, the Licensee again misses the point. After the earlier rejection of Maine Department of Inland Fisheries and Wildlife (MeDIFW) creel survey data, is the Licensee actually attempting to tell the Maine Department of Environmental Protection (MDEP) what it needs for information? The MDEP study request is designed to meet statutory goals, (MeDIFW) responsibility is fisheries management rather than determining water quality standard. In its comments in response to the April 7, 2022 letter filed by MDEP "Comment on Fish Assemblage Study", the Licensee in its April 27, 2022 filings, continues its constant refusals to collect meaningful Fish species data as required by the Clean Water Act (CWA).

The Licensee mentions that MeDIFW is the State's lead fisheries agency. This is correct and MeDIFW does an excellent job of managing angler use and harvest. The issue however, is the environment and water quality, salmon are only part of the equation. MDEP has a statutory mandate to determine if all project waters support fish and aquatic communities. The CWA requires this information. This is the responsibility of MDEP and in the absence of useful MeDIFW data they have been forced to ask for a fish assemblage study. The Study result will help MDEP determine if various WQC standards are being met. If project waters are not compliant, and it appears they are not, MDEP has the ability to order operational changes. Possible project operational modifications include lake management and downstream flow requirements. MeDIFW, somewhat "off handily", supported MDEP when they noted Ripogenus drawdown limits and unusually high West Branch flows in its October 8, 2021 filing. Thus, MeDIFW has a stake in the results.

MDEP study results in areas such as juvenile smelt and plankton communities data will provide useful management information to MeDIFW.

The Licensee continues to misuse and misrepresent MeDIFW data. Opinion is not fact. The fact is that MeDIFW has done an excellent effort in its creel survey of the Ripogenus Impoundment landlocked salmon (salmon) population. Another fact is study results are alarming in terms of the Ripogenus Impoundment salmon and rainbow smelt populations. Still, another fact is that MeDIFW creel surveys were not designed to identify the status of non-salmon species e.g. lake whitefish, cusk, smelt, white and yellow perch as any appearance in the "creel" is incidental i.e., not from a directed fishery. Non salmon species are a major concern to MDEP and their meeting of Water Quality Standards. Creel survey data presented by MeDIFW does not meet the objectives of MDEP's study request, namely identifying the status and relative abundance the of all fish species in the Ripogenus Impoundment.

Creel Surveys are a management tool that provide useful information on anglers and catch. However, such surveys do not account for fish species not vulnerable to angling. Creel surveys depend the presence of anglers and the vulnerability of fish species. If the fish are not hungry, they do not bite, thus they are not caught and sampled. Is the licensee suggesting that anglers fish for and catch "minnow" species? No amount of creel survey effort can account for this sampling bias. More robust measures (electrofishing, trap netting, seining, etc.) are required.

In prior filings, MeDIFW has provided conclusive data on the improvise Ripogenus Impoundment salmon population. A population that fails to meet MeDIFW and MDEP standards. The Ripogenus Impoundment adult salmon population (greater than 16 inches) are so in decline that MeDIFW has attempted to increase the harvest of subadult salmon, those less than 16 inches. MeDIFW claims there are too many salmon, I have claimed that the problem(s) lies elsewhere. There are issues with the juvenile smelt and zooplankton populations and the loss of littoral zone production(s). The Proposed MDEP studies will likely provide needed insight.

The Licensee states "MDIFW also noted that the inland fisheries management goals for the Ripogenus impoundment and river have not changed since the last license was approved." This statement is in contradiction with earlier statements. While a MeDIFW goal continues to be salmon management, rules and regulation

for the Ripogenus impoundment have drastically changed. In order to meet what MeDIFW calls an over-population of salmon, the legal size and harvest limits have been changed to encourage the harvest of sub adult salmon, there is NO harvest limit of salmon less than 16 inches. Compared to harvest limits of the late 1980's this a major shift in fisheries management goals. The decline in the salmon fishery coincides with the Licensees change in water management. Coincidence?

The Licensee backs up its refusal to conduct a "Fish Assemblage Study" with information from an April 15, 2022 phone call. *"The following is a brief summary of the discussion with MDIFW during the April 15th conference* call":

- *MDIFW has a good understanding on species composition in Chesuncook Lake and is comfortable with the information that is available.*
- *No exotic species are known to occur.*
- *MDIFW offered to generate a species list from recent and past angler creel data (1,000s of hours of fishing records) that will document indigenous game and non-game species.*
- *MDIFW may have information from stomach content analysis that could supplement the species list.*

Information provided by MeDIFW in the April 15 phone call is simply an update of previously filed reports. No new information is provided. Below, I offer a few remarks on the Licensee's interpretation MeDIFW's comments listed above

1. First, no biologist would characterize a phone call in this manner. It may be true that no new exotic species were evident in creel surveys. It is totally false that NO EXOTIC species occur. Salmon are exotic to the Ripogenus Impoundment as are white and yellow perch and most likely rainbow smelt. How can MeDIFW have an "*understanding on species composition in Chesuncook Lake*" based on biased angler surveys that depend on hungry fish? While MeDIFW creel survey provide useful information on a salmon population in collapse, there have been no trap net, minnow traps, electrofishing, trawling, seining or even gill netting efforts to collect fish species not vulnerable to angling. MeDIFW's understanding of "species composition" inhabiting the Ripogenus Impoundment may be adequate for fisheries management purposes but is totally inadequate in describing

existing the fish communities. Critical fish species information is needed by stakeholders, FERC staff and by MDEP to meet 401 WQC standards and provide corrective measures.

2 I am confident that MeDIFW believes there are no NEW exotic (fish) species. But how can they know with any certainty without the robust sampling proposed by MDEP?

3 The generation of yet another species list will not provide any new data. As noted above, this proposal is biased, as it depends on anglers and then salmon or trout preying on some unknown indigenous or exotic fish species perhaps spatially separated by habitat selection.

4 Salmon are known to depend primarily on rainbow smelt as a forage item. As MeDIFW has demonstrated by its preliminary smelt drift net collection downstream of McKay Station, the Ripogenus Project's juvenile smelt population has collapsed and this has impacted salmon growth in impoundment waters and the downstream West Branch. Thus, MeDIFW's suggestion that salmon stomach content analysis will provide additional information is unlikely, even extreme. The licensee is using a negative to prove a negative.

Even more important, how will FERC staff be informed of the status of lake whitefish (Coregonus clupeaformis) and smelt population? Diminished lake whitefish populations are currently a major MeDIFW concern. As noted above, juvenile smelt population in the Ripogenus Impoundment have declined to the point where they no longer provide a salmon food source in the West Branch downstream of McKay Station. These two important species of MeDIFW management concern must be sampled. Nothing reported in the April 15, 2022 conference call deals with these important fish species. The below is an abbreviated summary demonstrating the importance of lake whitefish to fisheries management as documented in the Vol I of the 2021 plan, Managing Maine's Inland Fisheries into the Future.

*Lake Whitefish: Goals, Objectives & Conservation/Management Strategies*

*Goal; Conserve native populations of lake whitefish Assess the status and health of all known populations of lake whitefish in Maine (High Priority)*

*• Develop an assessment plan to characterize population age structure and relative abundance to establish a baseline for this planning period.*

*Identify and implement strategies to reduce threats and protect lake whitefish (High Priority)*

*• Examine Department stocking and management programs to reduce potential impacts to lake whitefish populations, considerate of inter-specific competition, regulations, lake whitefish population abundance, angler use, and risk for new competing introduction.*

*Monitor lake whitefish populations (High Priority)*

*• Develop a long-term population monitoring program to assess changes in population size and age structure*
*• Identify habitats (e.g., spawning) where lake whitefish are more vulnerable to sampling*

*Monitor lake whitefish populations (High Priority)*

*• Develop a long-term population monitoring program to assess changes in population size and age structure*
*• Identify habitats (e.g., spawning) where lake whitefish are more vulnerable to sampling*

Clearly MeDIFW has a departmental mandate to accept or participate in a Ripogenus Impoundment fish assemblage study. Study results can only enhance fisheries management objectives, including and perhaps most importantly, lake whitefish. The 1992 License application documented a concentration of lake whitefish at the mouth of Umbazookus Stream. The only downside to fish assemblage studies is that it will confirm the Licensee's worse fears; project operations are degrading Ripogenus fish communities.

The Licensee is obviously concerned that updated 2022 data will weaken their arguments that "nothing has changed, everything is Ok". The Licensee's April 27, 2022 filing is simply another "data dump" coupled with legal arguments, no new fisheries data were provided. The apparent premise is that if they say "nothing has changed" enough, people will begin to believe them. Quote case law often

and perhaps the stakeholders and agencies will back away. Hopefully FERC staff will require the needed studies as this information will be needed when negotiations begin.

Ed Spear

307 Mt Hope Ave.
Bangor, Me 04401
Email: edspear1@yahoo.com
Phone: 207-217-4288

Kimberly D. Bose May 9, 2022
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426 Via Electronic Filing

Re: The Ripogenus Projects P-2572

Great Lakes Hydro America's April 29, 2022 Filing, Articles 402 and 406: Violations not Excursions?

The Licensee's April 29, 2022 filing calls the past winter's low flow event an "excursion" when it was, in fact, a violation of two License Articles; 402 and 406. Extreme low fall and winter flows impacted two salmon year class (fry from 2020 and eggs from 2021 spawning) and aquatic communities. The impact of lost salmon reproduction will be evident in two to four years.

The licensee's April 29, 2022 "after the fact" *salmon spawning and incubation minimum flow excursion* Article 402 notification is not only six months late but additionally, fails to acknowledge the obvious violation of Article 406 of the Ripogenus Project License. Low McKay Station flow events that began September 6, of 2021 (GHHA filing of March 23, 2022) and continued into April, 18 2022. This impacted juvenile landlocked salmon (salmon) habitat in all areas downstream of McKay Station. Article 406 was designed as mitigation. The goal was to produce young-of-the-year salmon in the Holbrook spawning and nursey bypass channel. Article 406 requires a flow of 35 cfs for the period beginning June 1, continuing until October 15. At that time flows are increased to 65 cfs. On September 17, 2021 the licensee photographed the upper section of the Holbrook bypass area. These pictures clearly show a reach with low flow and unsuited to meet goals developed by MeDIFW. This was the first documented violation of Article 406. Flows were further reduced March 4, 2022 (March 9, 2022 filing). The result was the additional loss of salmon fry and parr overwintering in the bypass and downstream reaches. This was in addition to spawning and incubation losses admitted to by the Licensee in its April 29, 2002 filing. In summary, poor flow management resulted in a serious and avoidable violation of Article 406 and the loss of two years classes of salmon; winter kill of fry spawned in 2020 and spawning failure in the fall of 2021

FERC's licensing and compliance process is based on trust. Licensees are <u>required</u> to follow conditions <u>imposed</u> to mitigate private use of a public resource. In this framework the licensee is <u>mandated</u> to self-report any failure, for whatever reason, to comply with the term of its license. As several filings by interested parties in the on-going relicensing have shown, Brookfield does not understand the rules, or worse is willfully ignoring them.

The Licensee wants the public and FERC staff to believe that it had no idea it was required to provide water to the Holbrook by-pass. They simply maintained a pattern of providing water and when it dried up the fish eggs and other habitat for six months it was an excursion from that pattern. A violation for which they show no remorse.

In my opinion, FERC must impose a civil penalty of at least modest proportion, to demonstrate to this licensee that compliance and trust must be introduced to its corporate hydroelectric operations.

Thank you for the opportunity to comment.

Ed Spear

307 Mt Hope Ave
Bangor, Me  04402
Email edspear1@yahoo.com
Phone: 207-217-4288

CC Ms. Alicia Burtner

May 12, 2022

Ms. Kimberly D. Bose
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

TROUT UNLIMITED
MAINE COUNCIL

**Via online submission to: http://www/ferc.gov (cross-filed)**

Subject: **Maine Council of Trout Unlimited Comments on the Minimum Flow Excursion Report dated April 28, 2022 for the Ripogenus Project (P-2572)**

Dear Secretary Bose:

On behalf of its six chapters and over 2,000 members, Maine Council of Trout Unlimited ("TU)" submits these comments on the Minimum Flow Excursion Report for the Ripogenus Project (P-2572) submitted by GLHA ("Brookfield" or "Operator") dated April 28, 2022. The event report was assigned sub-docket P-2572-136.

**The event**

Quoted from the report that is included for FERC staff convenience as Attachment A:

"*DESCRIPTION: Through agency consultation, a target flow of 1,100 cfs was established for the West Branch of the Penobscot River below McKay Station for the October 15 – November 15, 2021 spawning period. This 1,100 cfs target flow was then released from McKay Station from November 16, 2021 to March 4, 2022 for salmon egg incubation. On March 4th, the target flow was further reduced to 800 cfs through agency consultation; the 800 cfs target flow was then maintained until April 18, 2022, at which time increased and normal flows were resumed."*

"*OBSERVED OR REPORTED EFFECTS: Although the Maine Department of Inland Fisheries and Wildlife expressed concern that the reduced flows could affect salmonid redds, GLHA is not aware of any specific impacts to fish and wildlife resources, dam safety, or public safety resulting from this event*."

"*RESOURCE AGENCY COMMENTS: The Maine Departments of Inland Fisheries and Wildlife and Environmental Protection had questions and expressed concern with the reduced flows, but both supported the flow reductions (along with the Maine Land Use Planning Commission and the United States Fish and Wildlife Service) once they received additional information and better understood the drought conditions in the watershed and GLHA's water management actions in response to these conditions.*"[1]

[1] Minimum Flow Excursion Report for the Ripogenus Project (P-2572) dated April 28, 2022.

**Context**

The purpose of these comments is to provide context to the Brookfield Minimum Flow Excursion Report.

The existing license states: "*Minimum flows may be modified if required by hydrologic conditions beyond the control of the licensee, upon mutual agreement between the licensee, the U.S. Fish and Wildlife Service, DEP, LURC, and DIFW. If the flow is so modified, the licensee shall notify the Commission as soon as possible, but no later than 10 days after each such incident."*[2] As Mr. Ed Spear pointed out in his March 9 filing included as Attachment B: "*The key component of the above Article is: hydrologic conditions beyond the control of the licensee*."[3] Brookfield contributed to the hydrological conditions by releasing far more water than licensed minimum flow requirements that would not have exceeded 2300 cfs regardless if the operator considered the year a normal or a dry one. This fact was documented and described by the filing made by Ms. Kathleen Houston on March 13, 2022. This table is the most pertinent. The filing is included as Attachment C[4]

**AS OF SAT AUGUST 14 11:41AM EDT**

Total Flow 3100 cfs

**SHORT-TERM SCHEDULE**

| START DATE | START TIME | END DATE | END TIME | CFS |
|---|---|---|---|---|
| 8/11/2021 | 8:00 AM | 8/11/2021 | 9:00 PM | 3,000 |
| | 9:00 PM | 8/12/2021 | 8:00 AM | 1,800 |
| 8/12/2021 | 8:00 AM | 8/12/2021 | 5:00 PM | 2,200 |
| | 5:00 PM | 8/12/2021 | 9:00 PM | 3,400 |
| | 9:00 PM | 8/13/2021 | 8:00 AM | 1,800 |
| 8/13/2021 | 8:00 AM | 8/13/2021 | 12:00 PM | 2,000 |
| | 12:00 PM | 8/13/2021 | 5:00 PM | 3,000 |
| | 5:00 PM | 8/13/2021 | 9:00 PM | 3,400 |
| | 9:00 PM | 8/14/2021 | 8:00 AM | 1,800 |
| 8/14/2021 | 8:00 AM | 8/14/2021 | 5:00 PM | 2,200 |
| | 5:00 PM | 8/15/2021 | 8:00 AM | 1,800 |
| 8/15/2021 | 8:00 AM | 8/15/2021 | 5:00 PM | 2,200 |

The license terms and conditions the license minimum flow requirements are.[5]

[2] Ripogenus Project License, Project No. 2572-005 issued October 22, 1996, Article 402. Accession number 19961028-0056.
[3] Ed Spear letter dated March 9, 2022, Subject: Ripogenus Hydroelectric Project (FERC No. 2572), Yet Another West Branch of the Penobscot River Flow Violation Below McKay Station.
[4] Kathleen K Houston letter dated Subject: Ripogenus Project (FERC No. 2572); Minimum Flow Reductions Comments dated March 13, 2022. Page 2.
[5] Ripogenus Project Pre-application Document dated June 11, 2021. Page 4-45.

**Minimum Flow Requirements downstream of McKay Station for the Ripogenus Project[1]**

| Date Range | Minimum Flow Requirement |
|---|---|
| ***Fish Spawning or Incubation*** | |
| September 16 – October 14 | 1,000 cfs to facilitate drawdown of the North Twin impoundment (part of the Penobscot Mills Project) |
| October 15 – November 15 | At least 1,422 cfs or inflow, but not less than 1,300 cfs[2] for salmon spawning |
| November 16 – June 7 | Greater than 1,422 cfs (or the spawning flow established above for the year)[2] for salmon incubation |
| ***Whitewater*** | |
| May 1 – September 15 (8:30 AM – 5:00 PM) | Normal hydrologic year[3]:<br>• 2,300 cfs on Saturdays and Sundays<br>• 2,200 cfs on Mondays and Fridays<br>• 2,000 cfs on Tuesdays through Thursdays<br>Wet or dry hydrologic year[3]:<br>• 2,200 cfs on Saturdays and Sundays<br>• 2,000 cfs on Mondays and Fridays<br>• 1,800 cfs on Tuesdays through Thursdays |
| September 16 – October 1 (8:30 AM – 5:00 PM) | Normal hydrologic year[3]:<br>• 2,300 cfs on Saturdays and Sundays<br>Wet or dry hydrologic year[3]:<br>• 2,200 cfs on Saturdays and Sundays |
| June 8 – October 14 (5:00 PM – 8:30 AM) | 1,000 cfs |
| ***Station Outages*** | |
| Times of generating unit outage | 400 cfs with scheduled minimum flows identified above in table to be resumed as quickly as possible by releases from Ripogenus Dam if necessary but in no event in more than three days following the initial outage |

[1] Minimum flows shall be the minimum flows for each hourly period measured on the basis of an hourly average.
[2] Flows to be established each year in consultation with the USFWS and MDIFW.
[3] The whitewater flow for each month from May through September is determined on the first day of each month based on an analysis of Total Available Water as described in the Water Use Plan in the application for new license filed with the Commission on December 17, 1991. The determination of "wet," "normal," or "dry" shall remain constant during the month based on the first day of the month classification. The range of "normal" available water

**FERC should determine that the low flow event constitutes a license violation**

The Operator can't have it both ways: claim that operations below minimum flows were caused by a dry year while operating far in excess of the minimums only a couple of months before. Brookfield has owned the project for over ten years, so inexperience cannot be to blame.

**Other license violations continue to occur**

Brookfield holds that: "*Based on a review of the Projects' compliance history, GLHA has been and continues to be in compliance with the applicable Articles of the existing FERC Licenses, or have been otherwise communicated to FERC and the applicable resource agencies and addressed by GLHA*."[6] This claim is unsupported by the facts. Mr. Spear detailed additional matters that TU askes the Commission to consider as possible violations of the licenses for both the Ripogenus and the Penobscot Mills projects license provisions. These include:

[6] Id., page 4-66.

"*Article 402 – Ripogenus Project, Upper Gorge July-September 30 flows*

*Article 406 - Ripogenus Project, Holbrook Bypass Channel Salmon Spawning and Nursery Flows*

*Article 408 – Penobscot Mills Project, Irregular Flows*

*Article 413 -Millinocket Stream, Spring and Fall Brook Trout Stockings*"[7]

The filing also references the Use of the Water Management Plan: "*The Licensee has mostly ignored the 1996 Water Management Plan (WMP) and arbitrarily set up its own water management plan; a peaking operation driven by the market for electric power that conflicts with environmental needs."*[8] We have included this filing as Attachment D.

Brookfield has also stated that the PM&E Measures included in the current license are adequate: "*These PM&E measures comprehensively address resource interests specific to the Project areas, as well as the larger river basin. These interests include water quality; management and balancing of flows within and downstream of the West Branch; aquatic and terrestrial resources; whitewater and recreational opportunities; cultural resources; and land management."*[9] If this is so, then at least some of the cause of the problems previously described with Ripogenus-Chesuncook impoundment levels must be ascribed to the operator.

**Current license minimum flows are overly permissive**

Please note some of the numbers that define minimum flows under different conditions, especially 400 cfs and 100 cfs. They were not based on biotic studies; 400 cfs is the flow through the turbines with brakes applied when a generator trip occurs, 1000 cfs is the low end of effective single generator operation. 1422 cfs was determined from the median flows determined by catchment hydrography and is not supported by study data that sought to determine optimal or minimum flows for aquatic life. Mr. Spear reports that the 1000 cfs flow did not provide adequate watering of the Holbrook bypass designed to provide additional salmonid spawning and nursery habitat: "*On September 14, 2021 Licensee's staff photographed the upper Bypass Channel at a reported station flow of 1000 cfs (see the Licensee's September 30, 2021 filing). The two pictures show a flow that lacks surface turbulence and riffles, conditions needed for optimum YOY salmon production. Looking downstream from the intake gates, a long, flat stretch with an 'unbroken' surface is apparent. Such waters are not suitable for YOY salmon and salmon production is lost or reduced under a 1000 cfs flow regime*."[10] Flows were subsequently reduced to 800 cfs for nearly two months so fisheries impacts were bound to have occurred. "*The Maine Departments of Inland Fisheries and Wildlife and Environmental Protection had questions and expressed concern with the reduced flows*"[11] but did not have specific flow limits developed by scientific study upon which to base stronger objections. TU has documented that 400 cfs

[7] Ed Spear letter dated April 27, 2022, RE: Re: The Ripogenus and Penobscot Mills Projects P-2572 and P-2458 Great Lakes Hydro America's failure to meet 401 Water Quality Certification Articles and Protection, Migration and Enhancements Measures during 2021.
[8] Id., page 6.
[9] Ripogenus Project PAD, page 1-8.
[10] Ed Spear letter of April 27, 2022. Page 4
[11] Minimum Flow Excursion Report for the Ripogenus Project (P-2572) dated April 28, 2022.

results in strandings;[12] this minimum flow must be considered extremely permissive as flows low enough to cause major dewatering and stranding do not constitute license violations; there are no limits specified in the license as to how low the Ripogenus-Chesuncook Impoundment can be drawn down, the dewatering and profound effects on both the aquatic life and recreational opportunities are so well documented on the FERC docket that we see no need to repeat them in this filing. The reason for this is clear. Look at the filings on the FERC docket from the last relicensing, they include comments from a number of prominent politicians. At one point during 1993, three comments in a row were from state legislators: Accession numbers 19930915-0188, 19930915-0190, and 19930915-0191. Maximum political pressure was put on both FERC and the Maine Department of Environmental Protection.

**The Operator is providing the minimum flow data possible**

The FERC response to the report of strandings and other possible license violations described in the previous paragraph included the recommendation that Brookfield work with TU and look into strandings.[13] That has yet to happen as we explained in our PSP Comments[14] that we have not attached due to their size, accession number is provided. NOAA fisheries requested ten years of hourly operational data from the projects and reiterated their request in their Proposed Study Plan Comments because Brookfield had not provided it. As TU had noted in its prior filing,[15] Brookfield has had the data all along at least at one-minute granularity. The data Brookfield has provided was lake levels, and flows daily: minimum, maximum, and average. Given that the license minimum flows may vary hourly during summer months, this level of detail obscures possible license violations. Brookfield has continued to reject conducting stranding or ramping studies as detailed in its eleventh hour Proposed Study Plan filing[16] provided as Attachment F. All Brookfield does is to repeat previous references to Mr. Spear's Ramping study that it also rejects in favor of its Historical Operations Data Assessment Study which looks at historical data without regard for the effects of rapid cessations of flows resulting in the strandings that we have previously mentioned. Of additional note is that all of Brookfield's filings have included the notation "*Copyright © 2021, Great Lakes Hydro America, LLC. All rights reserved*." Once filed, the information contained therein became part of the public domain. We question why Brookfield sees such a need for secrecy during the study phase of relicensing designed to inform the relicensing process and wonder what Brookfield needs to hide.

**The Operator's problems managing flows at McKay Station go back to soon after assuming control of the Ripogenus Project**

Taking a longer view, Brookfield's contention that it "*has been and continues to be in compliance with the applicable Articles of the existing FERC Licenses"* becomes even weaker. Brookfield committed a license violation shortly after assuming control of Ripogenus operations by failing to provide the 100

[12] TU Letter dated January 5, 2022. Subject: Maine Council of Trout Unlimited Amplifying Report for Observed Low Flow Events for the Ripogenus Project (P-2572).

[13] FERC letter dated March 1, 2022. Page 3: *"…we encourage you to work with Trout Unlimited, the resource agencies, and Commission staff to develop a proposal to address strandings and include it in the final license application you file by September 30, 2024. In the meantime, we also encourage you to conduct aquatic habitat surveys immediately following any future unit outages, if time allows prior to restoration of flows*."

[14] TU RSP Comments dated April 7, 2022. Accession number 20220407-5187, page 4.

[15] Id, page 2.

[16] Brookfield letter of April 27, 2022, Subject: Ripogenus Hydroelectric Project (FERC No. 2572-133), Penobscot Mills Hydroelectric Project (FERC No. 2458-247), Response to Stakeholder Comments on Revised Study Plan, page 7.

cfs fishing flow required from July 1 to September 30 yearly.[17] We have included the FERC determination[18] as Attachment G. More recently and significantly, Brookfield apparently let the braking systems that ensures the 400 cfs generator trip flows to deteriorate by 2015. This caused an outage that lasted for days and necessitated deep gate releases to provide minimum flows. We have included an applicable filing for that incident as well as Attachment H.[19]

The NGOs involved with this relicensing are on record that: "*To date, any reasonable analysis of Brookfield's participation in the Ripogenus - Penobscot Mills relicensing process indicates that Brookfield is attempting to delay and confuse the process by failing to provide the data required by FERC with the PAD, and then rejecting study requests involving the data*."[20] We have attached that filing as well as Attachment I. Taken as a whole, the record is clear that Brookfield is being less than forthcoming with the Commission. Brookfield rejects both the stranding and ramping studies explaining that the Historical Operations Data Assessment Study "*will provide information on how the Ripogenus Project has been operated, including flows provided by McKay Station.*"[21] This plan is so vague that it can select data electively and provides no assurance that it would do other than demonstrate that Brookfield has been in compliance with the lax terms and conditions of its license most of the time: "*GLHA will present the operations data in relation to the applicable license requirements for the Projects.*"[22] We have attached the study plan as Attachment J. Given what has transpired since Brookfield purchased GLHA, should FERC accept this study in its Study Plan Determination and should it be accomplished, the commission should examine its contents with the utmost scrutiny and not use it as a basis for its Compliance Report required for the final licensing stage of the process.

We ask that when investigating the matters we have described above that Brookfield look further than just the events reported above and examine the flows occurring during the timeframe from August 1, 2021 and the present. If violations are found to have occurred then we ask that the window of scrutiny be expanded so that the extent of violations can be fully determined. If Brookfield has been guilty of multiple license violations, then they should be considered matters in aggravation when determining if FERC should take enforcement action.

[17] Ripogenus PAD, page 4-43: "*Pursuant to Article 401 of the existing license, a minimum flow of 100 cfs is released from Ripogenus Dam into the bypassed reach (Upper Gorge) from July 1 through September 30 annually.*"

[18]

[19] Brookfield letter dated January 7, 2016, RE: Ripogenus Project 2572, Article 402 Compliance; Follow-up to June 13, 2015 Flow Excursion due to McKay Station Outage

[20] Preliminary Comments on the Proposed Study Plan (PSP) for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458), page 4.

[21] Brookfield letter of April 27, 2022, Subject: Ripogenus Hydroelectric Project (FERC No. 2572-133), Penobscot Mills Hydroelectric Project (FERC No. 2458-247), Response to Stakeholder Comments on Revised Study Plan, page 7.

[22] RSP, Pages J-1 through J-3, Historical Operations Data Assessment Study Plan.

**Enforcement action should be seriously considered by the Commission**

FERC has taken a more aggressive stance on enforcement actions since the dam failures in Michigan that occurred in 2019,[23] most recently Ampersand Cranberry Lake Hydro LLC[24] that seems to TU to be less impactful than the recent events involving the Ripogenus Project. These events prompted the letter filed by Mr. Spear that recommends enforcement action that we have included as Attachment J. Should FERC decide that enforcement action is warranted, we propose that rather than a fine, Brookfield should be required to install and maintain a USGS gage at some location between McKay Station and Telos Bridge to be determined by USGS. FERC Compliance would be saved needless effort and delay obtaining data from the Operator if those impacted by the low flows not constituting license violations had ready access to flow data readily available on the USGS National Water Information System: Web Interface.

**Conclusion with Requests**

Maine TU Council appreciates the Commission's continuing attention to compliance issues involving the Ripogenus and Penobscot Mills Projects. Compliance history is a factor to be considered during the final licensing phase and we trust that the information contained in this filing will prove useful then as well as now.

We ask that the Commission investigate the matter contained in this letter for possible license violations, and if new violations are found, expand the scope of their investigation.

Should FERC decide that enforcement action is warranted, we propose that Brookfield be required to install a USGS compatible flow gage between McKay Station and Telos Bridge at Brookfield expense and be maintained at their expense for the next ten years. We think that this would not only be appropriate but would also serve to prevent stakeholders filing low flow reports with FERC and necessitating investigations where if a USGS gage were present, no report would need to be filed.

We additionally note that if FERC obtains additional operational data reported hourly or by the minute, that this be made part of the public record and appear on the applicable FERC dockets.

TU reiterates its request for a copy of the Brookfield Renewable 11th Part 12D Independent Consultant's Safety Inspection Report and associated Potential Failure Mode Analysis Addendum for the Ripogenus Project under P-2572, Accession Number 20211229-5198, especially the addendum as previously requested.[25]

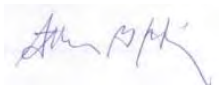
[23] FERC imposes $15M penalty for Dam Safety Violations at Michigan Dams, accessed at https://nbc25news.com/news/local/ferc-imposes-15m-penalty-for-dam-safety-violations-at-michigan-dams

[24] FERC fines New York hydro power project owner for license violation, article accessed at https://www.hydroreview.com/regulation-and-policy/ferc-penalizes-ampersand-cranberry-lake-hydro-for-license-violation/#gref

[25] TU letter dated January 22, 2022, Subject: Maine Council of Trout Unlimited Amplifying Report for Observed Low Flow Events for the Ripogenus Project (P-2572), page 9.

We have cross-filed this document to dockets 2572-133 and P-2458-247 as it bears directly on the relicensings in progress.

Sincerely and respectfully,



Stephen G. Heinz
Maine TU Council FERC Coordinator

Additional distribution: FERC Dockets P-2572-133, P-2458-247

ATTACHMENTS:

A - Minimum Flow Excursion Report for the Ripogenus Project (P-2572) dated April 28, 2022.

B - Ed Spear letter dated March 9, 2022, Subject: Ripogenus Hydroelectric Project (FERC No. 2572), Yet Another West Branch of the Penobscot River Flow Violation Below McKay Station.

C - Kathleen K Houston letter dated Subject: Ripogenus Project (FERC No. 2572); Minimum Flow Reductions Comments dated March 13, 2022.

D- Ed Spear letter dated April 27, 2022, RE: Re: The Ripogenus and Penobscot Mills Projects P-2572 and P-2458 Great Lakes Hydro America's failure to meet 401 Water Quality Certification Articles and Protection, Migration and Enhancements Measures during 2021

E - Brookfield letter of April 27, 2022, Subject: Ripogenus Hydroelectric Project (FERC No. 2572-133), Penobscot Mills Hydroelectric Project (FERC No. 2458-247), Response to Stakeholder Comments on Revised Study Plan

F -FERC letter dated September 2, 2011. Subject: Article 401 – Minimum Flow Deviation

G – Brookfield letter dated June 23, 2015. RE: Ripogenus Project 2572; Article 402 Compliance; Flow Excursion due to McKay Station Outage

H - Preliminary Comments on the Proposed Study Plan (PSP) for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458)

I - Historical Operations Data Assessment Study

J - Ed Spear letter dated May 9, 2022. Re: The Ripogenus Projects P-2572; Great Lakes Hydro America's April 29, 2022 Filing, Articles 402 and 406: Violations not Excursions?

**Attachment A**

Brookfield Renewable

April 28, 2022

**Ripogenus Project**
**FERC No. 2572-ME**

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Subject: Ripogenus Project (FERC No. 2572-ME); Minimum Flow Excursion**

Dear Secretary Bose:

As follow-up to an update provided to the Commission on March 9, 2022, Great Lakes Hydro America, LLC (GLHA), licensee for the Ripogenus Project, is reporting a salmon spawning and incubation minimum flow excursion that occurred at the Project's McKay Station from October 15, 2021 to April 18, 2022.

Please see the attached excursion reporting form for details.

If you have any questions, please contact me by phone at (207) 951-5006 or by e-mail at kevin.bernier@brookfieldrenewable.com.

Sincerely,

Kevin Bernier

Kevin Bernier
Senior Compliance Specialist

Attachments

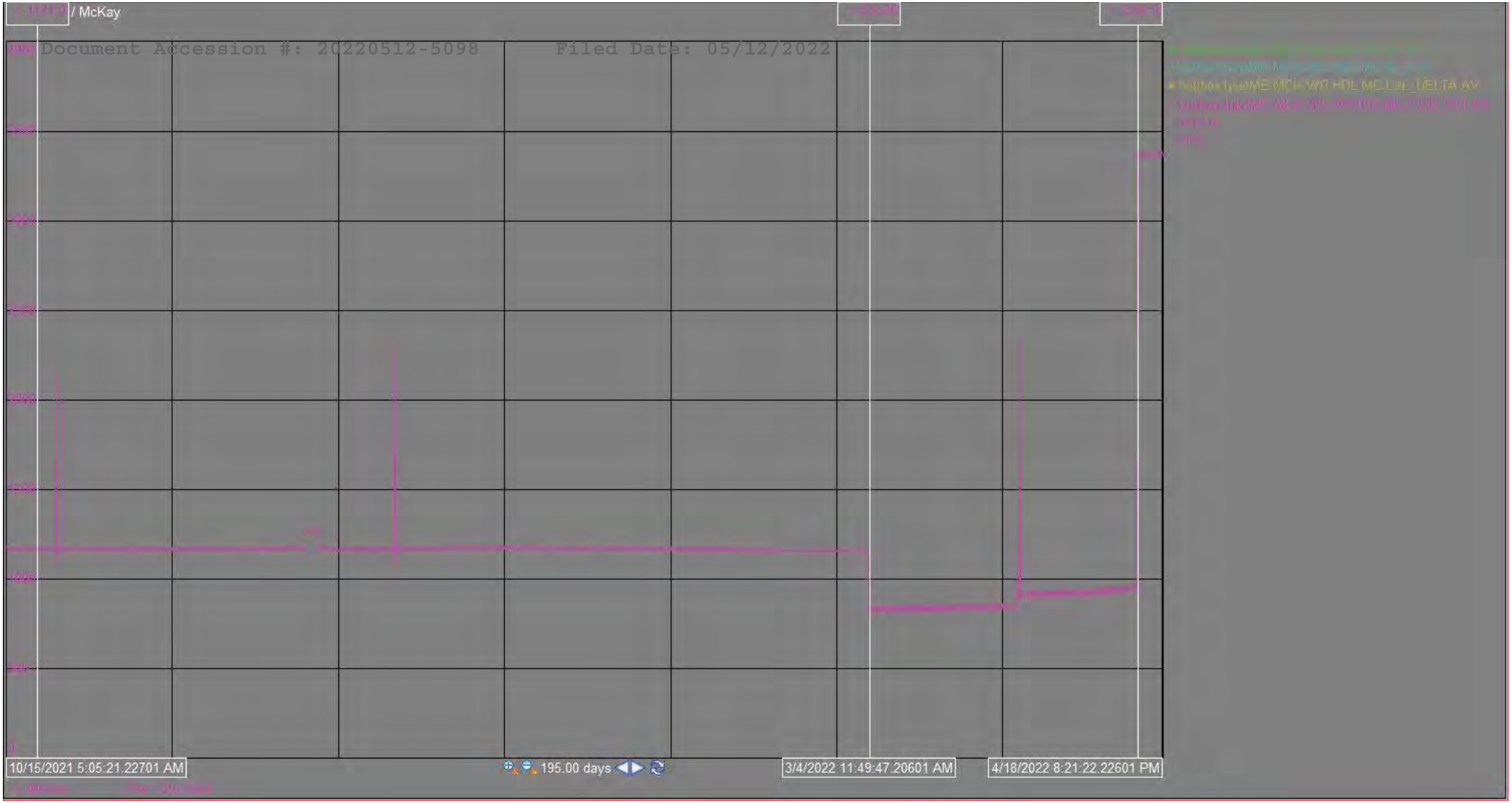
Cc: J. Rosset, B. Sojkowski, A. Cross; USFWS
J. Perry, T. Obrey, D. Kane; MDIFW
K. Olcott; MDEP
R. Goodmen, K. Shores; MLUPC
J. Cole, N. Stevens, S. Michaud, R. Dill, K. Maloney, L. Macomber, S. Farrington, T. Mapletoft, M. Osborne, D. Heidrich, R, Dorman, P. McNelis, P. Wainwright; GLHA

GLHA File: HSSE 19(a)(ii)

Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462
www.brookfieldrenewable.com
Tel: 207.723.4341
Fax: 207.723.3948

| Brookfield | | | COMPLIANCE EXCURSION REPORT | | |
|---|---|---|---|---|---|
| **Project No(s):** | FERC No. 2572-ME | | **Project Name(s):** | Ripogenus Project | |
| **Licensee(s):** | Great Lakes Hydro America, LLC (GLHA) | | **Facility:** | McKay Station | |
| **SUBJECT:** | Minimum Flow Excursion | | | | |
| **BACKGROUND** (e.g. License Article/ Requirement; Permit Condition; Operating Procedure, etc.): | Article 402 of the Ripogenus Project license states in relevant part that, "The licensee shall release from the Ripogenus Project into the West Branch of the Penobscot River below McKay Station the following minimum flows: Salmon spawning flows of at least 1,422 cfs or inflow, but not less than 1,300 cfs, from October 15 to November 15, and salmon incubation flows greater than 1422 cfs (or the spawning flow established for that year) from November 16 through June 7. These flows shall be established each year in consultation with the U.S. Fish and Wildlife Service and Maine Department of Inland Fisheries and Wildlife." | | | | |
| **DATE OF EVENT:** | 10/15/21 – 4/18/22 | **TIME OF EVENT:** | N/A | **DURATION:** | 185 days |
| **DESCRIPTION:** | Through agency consultation, a target flow of 1,100 cfs was established for the West Branch of the Penobscot River below McKay Station for the October 15 – November 15, 2021 spawning period. This 1,100 cfs target flow was then released from McKay Station from November 16, 2021 to March 4, 2022 for salmon egg incubation. On March 4th, the target flow was further reduced to 800 cfs through agency consultation; the 800 cfs target flow was then maintained until April 18, 2022, at which time increased and normal flows were resumed. | | | | |
| **CAUSE:** | Salmon spawning and incubation flows were reduced due to severe drought conditions in the Upper Penobscot drainage. | | | | |
| **CORRECTIVE MEASURES:** | **IMMEDIATE ACTION** | Reduced salmon spawning and incubation flows were implemented on October 15, 2021, and then further reduced on March 4, 2022, in order to conserve water in response to severe drought conditions. | | | |
| | **LONG-TERM ACTION** | None – the reduced flows were beyond GLHA's control. | | | |
| **OBSERVED OR REPORTED EFFECTS:** | Although the Maine Department of Inland Fisheries and Wildlife expressed concern that the reduced flows could affect salmonid redds, GLHA is not aware of any specific impacts to fish and wildlife resources, dam safety, or public safety resulting from this event. | | | | |
| **AGENCIES NOTIFIED** (attach correspondence): | **Method of Initial Notification:** ☐ Phone x Email ☐ Letter **Date of Notification**: multiple (attached)<br>**Federal Agencies**: x USFWS ☐ NMFS ☐ USACE x FERC ☐ Other(s): _____<br>**State Agencies:** STATE: Maine x Env. Prot x F&W ☐ Dam Safety ☐ Other(s) Land Use Planning<br>**Other Agencies/NGOs**: None | | | | |
| **RESOURCE AGENCY COMMENTS:** | The Maine Departments of Inland Fisheries and Wildlife and Environmental Protection had questions and expressed concern with the reduced flows, but both supported the flow reductions (along with the Maine Land Use Planning Commission and the United States Fish and Wildlife Service) once they received additional information and better understood the drought conditions in the watershed and GLHA's water management actions in response to these conditions. | | | | |
| **ADDITIONAL INFORMATION /COMMENTS:** | None | | | | |

| **EXCURSION REPORT BY:** (please print) | **DATE:** |
|---|---|
| Kevin Bernier – Senior Compliance Specialist | 4/27/22 |


/ McKay
Document Accession #: 20220512-5098
Filed Date: 05/12/2022
10/15/2021 5:05:21.22701 AM
195.00 days
3/4/2022 11:49:47.20601 AM
4/18/2022 8:21:22.22601 PM

| | |
|---|---|
| **From:** | Bernier, Kevin |
| **To:** | Dunham, Kevin; Tim Obrey (tim.obrey@maine.gov); Bryan Sojkowski; John Perry (john.perry@maine.gov); Julianne Rosset (julianne_rosset@fws.gov); Sferra, Christopher; Kathy Howatt (Kathy.howatt@maine.gov); Kelly Shores (Kelly.Shores@maine.gov); Ruby Goodmen (Ruby.Goodmen@maine.gov) |
| **Cc:** | Cole, James; Osborne, Michael; Maloney, Kelly; Dill, Richard; Farrington, Stephen; Michaud, Steve; Stevens, Nate; Mapletoft, Thomas; Kessel, Miranda; Macomber, Lance; Dorman, Randy |
| **Subject:** | West Branch 2021 salmon spawning flow, Ripogenus Project |
| **Date:** | Monday, October 4, 2021 8:50:00 PM |
| **Attachments:** | image001.jpg |

As required by Article 402 of the Ripogenus Project FERC License, Great Lakes Hydro America, LLC (GLHA) must provide the following flows to the West Branch of the Penobscot River below McKay Station:

> *"salmon spawning flows of at least 1,422 cfs or inflow, but not less than 1,300 cfs, from October 15 to November 15 and salmon incubation flows greater than 1,422 cfs (or the spawning flow established above for that year) from November 16 through June 7. These flows shall be established each year in consultation with the U.S. Fish and Wildlife Service and Maine Department of Inland Fisheries and Wildlife*."

However, the Ripogenus FERC license also allows this minimum flow to be modified if required by hydrologic conditions, specifically:

> "*Minimum flows may be modified if required by hydrologic conditions beyond the control of the licensee, upon mutual agreement between the licensee, the U.S. Fish and Wildlife Service, DEP, LURC, and DIFW*".

Due to the current low Ripogenus impoundment level that has resulted from this year's drought (down over 21 feet from full pond this morning), GLHA is proposing to set 1,100 cfs as the 2021 target spawning flow for McKay Station for the October 15 to November 15 period. This spawning flow needs to be low enough so that subsequent egg incubation flows can be maintained throughout the winter that are at least as high as the spawning flow; thus, GLHA needs to set the spawning flow as low as possible to ensure that these incubation flows can be provided, given the limited water storage currently available upstream. Inflows into the Ripogenus impoundment are currently running at about 930 cfs, so even under this reduced spawning flow, the Ripogenus impoundment will continue to drop until the upper Penobscot drainage gets some rain.

Please provide any comments or questions on this proposed spawning flow by Wednesday, October 13th, and note that I'll assume your concurrence with the proposed 1,100 cfs spawning flow if I don't hear from you. Thank you.

**Kevin Bernier**
Senior Compliance Specialist

**Brookfield Renewable**
1024 Central Street, Millinocket, ME 04462
**C** 207 951 5006
kevin.bernier@brookfieldrenewable.com
www.brookfieldrenewable.com

| | |
|---|---|
| **From:** | Bernier, Kevin |
| **To:** | Dunham, Kevin; Tim Obrey (tim.obrey@maine.gov); Bryan Sojkowski; John Perry (john.perry@maine.gov); Julianne Rosset (julianne_rosset@fws.gov); Kathy Howatt (Kathy.howatt@maine.gov); Kelly Shores (Kelly.Shores@maine.gov); Ruby Goodmen (Ruby.Goodmen@maine.gov); Cross, Amanda S; Gallant, Kevin |
| **Cc:** | Cole, James; Osborne, Michael; Maloney, Kelly; Dill, Richard; Farrington, Stephen; Michaud, Steve; Stevens, Nate; Mapletoft, Thomas; Macomber, Lance; Dorman, Randy; Pelletier, Julie |
| **Subject:** | Minimum flow reduction proposals for Ripogenus and Millinocket |
| **Date:** | Wednesday, February 23, 2022 1:29:00 PM |
| **Attachments:** | image001.jpg |

Due to the ongoing severe drought conditions in portions of the upper Penobscot watershed (see Maine | Drought.gov for current and historic drought conditions in Maine), Great Lakes Hydro America, LLC (GLHA), licensee for the Storage (FERC No. 2634), Ripogenus (FERC No. 2572), and Penobscot Mills (FERC No. 2458) Projects, has been implementing water conservation measures on the Upper Penobscot since the current drought intensified beginning in 2020. Due to impoundment levels and snowpack water content that are both running well below average, GLHA is proposing to reduce minimum flows further (to 800 cfs at Ripogenus, and 1,000 cfs at Millinocket) as was done during the 2001 – 2003 severe drought. Recent snow surveys in the upper Penobscot drainage have shown average water content in the snow to be about 20% below the long-term average. In addition, water levels are currently much lower than normal in both the Ripogenus (over 24 feet below full pond) and North Twin (almost 8 feet below full pond) impoundments.

Article 402 of the Ripogenus Project license states in relevant part that, "*The licensee shall release from the Ripogenus Project into the West Branch of the Penobscot River below McKay Station the following minimum flows: Salmon spawning flows of at least 1,422 cfs or inflow, but not less than 1,300 cfs, from October 15 to November 15, and salmon incubation flows greater than 1422 cfs (or the spawning flow established for that year) from November 16 through June 7.*" As indicated in GLHA's October 4, 2021 e-mail (see below), last fall's spawning and incubation flow was set at only 1,100 cfs due to the drought and low water level conditions. However, the Ripogenus impoundment has continued to drop despite this flow reduction. Article 402 of the Ripogenus Project license also allows GLHA to modify the minimum flows from McKay station if required by hydrologic conditions beyond GLHA's control. Such flow modifications must be mutually agreed upon between GLHA, the U.S. Fish and Wildlife Service (F&WS), the Maine Department of Inland Fisheries and Wildlife (IF&W), the Maine Department of Environmental Protection (DEP), and the Maine Land Use Regulation Commission (now the Land Use Planning Commission - LUPC). GLHA must then notify FERC within 10 days of the event.

Article 403 of the Penobscot Mills license states in part that, "*The licensee shall operate the Millinocket, Dolby, and East Millinocket developments in a run-of-river mode while providing an instantaneous minimum flow of 2,000 cubic feet per second (cfs) to the West Branch of the Penobscot River at Millinocket, for the protection of water quality and aquatic habitat in the Penobscot River.*" Article 402 also allows run-of-river operation or minimum flows to be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods upon mutual agreement between the licensee, the U.S. Fish and Wildlife Service, and the Maine DEP. GLHA must then notify FERC within 10 days after the event.

As indicated above, GLHA requests agency concurrence for minimum flow reductions at both Ripogenus (to 800 cfs from the current 1,100 cfs) and at Millinocket (to 1,000 cfs from the current

2,000 cfs) due to the continued drought and low water level conditions. Please respond to this proposal **by the end of this week**, as GLHA intends to implement these flow reductions early next week. Thank you.

**Kevin Bernier**
Senior Compliance Specialist

**Brookfield Renewable**
1024 Central Street, Millinocket, ME 04462
**C** 207 951 5006
kevin.bernier@brookfieldrenewable.com
www.brookfieldrenewable.com



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**From:** Goodmen, Ruby
**To:** Bernier, Kevin
**Subject:** RE: Minimum flow reduction proposals for Ripogenus and Millinocket
**Date:** Thursday, February 24, 2022 11:55:25 AM
**Attachments:** image003.png

Good morning Kevin,

The staff at the Land Use Planning Commission finds that there would be no undue adverse effect by reducing the minimum flow at either Ripogenus or Millinocket.

Thanks,

Ruby

Ruby Goodmen, Environmental Specialist II
Land Use Planning Commission
Department of Agriculture, Conservation and Forestry
43 Lakeview St. Greenville, Maine 04441
Office: (207) 695-2466
Mobile: (207) 349-0941
**https://www.maine.gov/dacf/lupc/**

Maine_DACF

| | |
|---|---|
| **From:** | Perry, John |
| **To:** | Bernier, Kevin; Dunham, Kevin; Obrey, Tim; Sojkowski, Bryan; Rosset, Julianne; Howatt, Kathy; Shores, Kelly; Goodmen, Ruby; amanda_cross; Gallant, Kevin |
| **Cc:** | Cole, James; Osborne, Michael; Maloney, Kelly; Dill, Richard; Farrington, Stephen; Michaud, Steve; Stevens, Nate; Mapletoft, Thomas; Macomber, Lance; Dorman, Randy; Pelletier, Julie; Brautigam, Francis |
| **Subject:** | RE: Minimum flow reduction proposals for Ripogenus and Millinocket |
| **Date:** | Thursday, February 24, 2022 5:48:49 PM |
| **Attachments:** | image002.png |

Kevin,

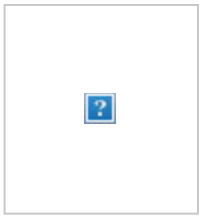
MDIFW is concerned with this proposed further reduction in minimum flows, down to 800 cfs at Ripogenus and 1,000 cfs at Millinocket. We anticipate there could be additional impacts on salmonid redds in these project areas. Before we can fully consider even lower flow releases that might further impact the natural resources, we would like a better understanding of the status of generation flow releases and other water conservation practices undertaken by Brookfield. Are the magnitude, duration, and frequency of generating flows being curtailed? A better understanding of any measures GLHA has been undertaking with their production releases is requested.

Also, we believe now is the time to examine alternatives for the coming spring given the high likelihood that the impoundment elevations will be significantly below the long-term average for a third consecutive year. Does GHLA have a plan for this spring, assuming the drought conditions continue through the winter? A wait and see approach will greatly challenge opportunities for meaningful and timely collaboration, including shared messaging to the public.

We understand GLHA's desire for quick concurrence, but we are requesting more information so that a more balanced resolution can be achieved, if possible.

John

**John Perry**
**Environmental Review Coordinator**
Maine Department of Inland Fisheries and Wildlife
353 Water Street, 41 SHS
Augusta, Maine 04333-0041
Cell (207) 446-5145
www.mefishwildlife.com



*Correspondence to and from this office is considered a public record and may be subject to a request under the Maine Freedom of Access Act. Information that you wish to keep confidential should not be included in email correspondence.*

| | |
|---|---|
| **From:** | Bernier, Kevin |
| **To:** | Perry, John; Dunham, Kevin; Obrey, Tim; Sojkowski, Bryan; Rosset, Julianne; Howatt, Kathy; Shores, Kelly; Goodmen, Ruby; amanda_cross; Gallant, Kevin; Brautigam, Francis |
| **Cc:** | Cole, James; Osborne, Michael; Maloney, Kelly; Dill, Richard; Farrington, Stephen; Michaud, Steve; Stevens, Nate; Mapletoft, Thomas; Macomber, Lance; Dorman, Randy; Pelletier, Julie |
| **Subject:** | RE: Minimum flow reduction proposals for Ripogenus and Millinocket |
| **Date:** | Friday, February 25, 2022 2:18:00 PM |
| **Attachments:** | image001.png |

John – our answers to your questions are below (in red). Let me know if you have any further questions.

Kevin Bernier

**From:** Perry, John <John.Perry@maine.gov>
**Sent:** Thursday, February 24, 2022 5:49 PM
**To:** Bernier, Kevin <Kevin.Bernier@brookfieldrenewable.com>; Dunham, Kevin <Kevin.Dunham@maine.gov>; Obrey, Tim <Tim.Obrey@maine.gov>; Sojkowski, Bryan <bryan_sojkowski@fws.gov>; Rosset, Julianne <julianne_rosset@fws.gov>; Howatt, Kathy <Kathy.Howatt@maine.gov>; Shores, Kelly <Kelly.Shores@maine.gov>; Goodmen, Ruby <Ruby.Goodmen@maine.gov>; amanda_cross <amanda_cross@fws.gov>; Gallant, Kevin <Kevin.Gallant@maine.gov>
**Cc:** Cole, James <James.Cole@brookfieldrenewable.com>; Osborne, Michael <Michael.Osborne@brookfieldrenewable.com>; Maloney, Kelly <Kelly.Maloney@brookfieldrenewable.com>; Dill, Richard <Richard.Dill@brookfieldrenewable.com>; Farrington, Stephen <Stephen.Farrington@brookfieldrenewable.com>; Michaud, Steve <Stephen.Michaud@brookfieldrenewable.com>; Stevens, Nate <Nathan.Stevens@brookfieldrenewable.com>; Mapletoft, Thomas <Thomas.Mapletoft@brookfieldrenewable.com>; Macomber, Lance <Lance.Macomber@brookfieldrenewable.com>; Dorman, Randy <Randy.Dorman@brookfieldrenewable.com>; Pelletier, Julie <Julie.Pelletier@brookfieldrenewable.com>; Brautigam, Francis <Francis.Brautigam@maine.gov>
**Subject:** RE: Minimum flow reduction proposals for Ripogenus and Millinocket

Kevin,

MDIFW is concerned with this proposed further reduction in minimum flows, down to 800 cfs at Ripogenus and 1,000 cfs at Millinocket. We anticipate there could be additional impacts on salmonid redds in these project areas. Before we can fully consider even lower flow releases that might further impact the natural resources, we would like a better understanding of the status of generation flow releases and other water conservation practices undertaken by Brookfield. Are the magnitude, duration, and frequency of generating flows being curtailed? A better understanding of any measures GLHA has been undertaking with their production releases is requested. Yes, generation on the Penobscot has been severely affected by the drought. For example, the Ripogenus Project generation reported to FERC for the most recent time period (October 1, 2020 – September 30, 2021) was 28% lower than the average generation reported for the previous 3 years. Since this generation report was filed with FERC last fall, generation at Ripogenus has continued to trend even

lower, averaging over 50% lower than the long-term average. As you also requested, below are examples of the water conservation measures that GLHA has implemented on the Upper Penobscot during the current drought:

- The Canada Falls, Seboomook, Caucomgomoc, and Ragged Lake Developments have been largely operating at minimum flow, or at a reduced minimum flow developed through agency consultation, since the current drought began in 2020.
- Through agency consultation, the Ripogenus spawning and incubation flows (which are required from October 15th – June 7th) have been set at 1,300 and 1,100 cfs in 2020 and 2021 respectively, much lower than the 1,700 cfs flow that had been set annually the previous 7 years. GLHA has not deviated from the current 1,100 cfs minimum flow since it was set in October.
- Ripogenus flows have been routinely reduced during non-rafting hours (i.e., from 5:00 p.m. to 8:30 a.m.) to conserve water storage in the Ripogenus impoundment.

Also, we believe now is the time to examine alternatives for the coming spring given the high likelihood that the impoundment elevations will be significantly below the long-term average for a third consecutive year. Does GHLA have a plan for this spring, assuming the drought conditions continue through the winter? A wait and see approach will greatly challenge opportunities for meaningful and timely collaboration, including shared messaging to the public. Due to the current low water levels and reduced snowpack, GLHA is proactively proposing the reduced minimum flows now in preparation for the spring, exactly because we do not want to take a wait and see approach. The water situation in the spring will dictate whether additional measures (such as reductions in whitewater rafting flows, which would further reduce generation) are necessary.

We understand GLHA's desire for quick concurrence, but we are requesting more information so that a more balanced resolution can be achieved, if possible.

John

**John Perry**
**Environmental Review Coordinator**
Maine Department of Inland Fisheries and Wildlife
353 Water Street, 41 SHS
Augusta, Maine 04333-0041
Cell (207) 446-5145
www.mefishwildlife.com



*Correspondence to and from this office is considered a public record and may be subject to a request*

| | |
|---|---|
| **From:** | Perry, John |
| **To:** | Bernier, Kevin; Dunham, Kevin; Obrey, Tim; Sojkowski, Bryan; Rosset, Julianne; Howatt, Kathy; Shores, Kelly; Goodmen, Ruby; amanda_cross; Gallant, Kevin; Brautigam, Francis |
| **Cc:** | Cole, James; Osborne, Michael; Maloney, Kelly; Dill, Richard; Farrington, Stephen; Michaud, Steve; Stevens, Nate; Mapletoft, Thomas; Macomber, Lance; Dorman, Randy; Pelletier, Julie |
| **Subject:** | RE: Minimum flow reduction proposals for Ripogenus and Millinocket |
| **Date:** | Monday, February 28, 2022 5:14:21 PM |
| **Attachments:** | image001.png |

Thank you for the additional information, Kevin. MDIFW supports the minimum flow reductions at both Ripogenus (to 800 cfs from the current 1,100 cfs) and at Millinocket (to 1,000 cfs from the current 2,000 cfs).

John

**John Perry**
**Environmental Review Coordinator**
Maine Department of Inland Fisheries and Wildlife
353 Water Street, 41 SHS
Augusta, Maine 04333-0041
Cell (207) 446-5145
www.mefishwildlife.com



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**From:** Howatt, Kathy
**To:** Bernier, Kevin
**Cc:** Cole, James; Osborne, Michael; Maloney, Kelly; Dill, Richard; Farrington, Stephen; Michaud, Steve; Stevens, Nate; Perry, John; Mapletoft, Thomas; Macomber, Lance; Dorman, Randy; Pelletier, Julie; Dunham, Kevin; Rosset, Julianne; Sojkowski, Bryan; Obrey, Tim; Shores, Kelly; Goodmen, Ruby; amanda_cross; Gallant, Kevin; Brautigam, Francis; Mohlar, Robert C; DiFranco, Jeanne L; Bacon, Linda C
**Subject:** RE: Minimum flow reduction proposals for Ripogenus and Millinocket
**Date:** Tuesday, March 1, 2022 7:29:10 AM

---

Good morning Kevin,

I've reviewed your responses to DIFW's inquiry, below, and appreciate a clearer understanding of GLHA's water management practices at the West Branch Hydro Projects. The Department concurs with GLHA's proposal to reduce flows at Ripogenus Hydro and Millinocket (Penobscot Mills hydro). I have just one follow on question;

1. What's GLHA's plan for water management when conditions improve and inflow increases? Will GLHA increase minimum flows as water is available until the projects return to licensed minimum flows, or does it plan to hold all or some of that water in the storage reservoirs?

Thanks,

Kathy

Kathy Davis Howatt
Hydropower Coordinator, Bureau of Land Resources
Maine Department of Environmental Protection
Phone: 207-446-2642
www.maine.gov/dep

***Correspondence to and from this office is considered a public record and may be subject to a request under the Maine Freedom of Access Act. Information that you wish to keep confidential should not be included in email correspondence.***

| | |
|---|---|
| **From:** | Rosset, Julianne |
| **To:** | Howatt, Kathy; Bernier, Kevin |
| **Cc:** | Cole, James; Osborne, Michael; Maloney, Kelly; Dill, Richard; Farrington, Stephen; Michaud, Steve; Stevens, Nate; Perry, John; Mapletoft, Thomas; Macomber, Lance; Dorman, Randy; Pelletier, Julie; Dunham, Kevin; Sojkowski, Bryan; Obrey, Tim; Shores, Kelly; Goodmen, Ruby; Cross, Amanda S; Gallant, Kevin; francis.brautigam; Mohlar, Robert C; DiFranco, Jeanne L; Bacon, Linda C |
| **Subject:** | Re: [EXTERNAL] RE: Minimum flow reduction proposals for Ripogenus and Millinocket |
| **Date:** | Tuesday, March 1, 2022 7:52:00 AM |

Hi Kevin,

The United States Fish and Wildlife Service concurs with the Department of Inland Fisheries and Wildlife and the Department of Environmental Protection regarding Great Lake Hydro American's February 23, 2022 request (i.e., the minimum flow reductions at both Ripogenus (to 800 cfs from the current 1,100 cfs) and at Millinocket (to 1,000 cfs from the current 2,000 cfs)).

Best.
Julianne

**Julianne Rosset** (she/her)

Hydropower Coordinator | Maine Field Office

United States Fish and Wildlife Service

306 Hatchery Road, East Orland, ME 04431

207-298-3080 | julianne_rosset@fws.gov

fws.gov/mainefieldoffice/|facebook.com/usfwsnortheast/

**From:** Howatt, Kathy
**To:** Bernier, Kevin
**Subject:** RE: Minimum flow reduction proposals for Ripogenus and Millinocket
**Date:** Wednesday, March 2, 2022 9:50:40 AM

Thanks Kevin,
Kathy

Kathy Davis Howatt
Hydropower Coordinator, Bureau of Land Resources
Maine Department of Environmental Protection
Phone: 207-446-2642
www.maine.gov/dep

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---

**From:** Bernier, Kevin <Kevin.Bernier@brookfieldrenewable.com>
**Sent:** Wednesday, March 02, 2022 8:16 AM
**To:** Howatt, Kathy <Kathy.Howatt@maine.gov>
**Cc:** Cole, James <James.Cole@brookfieldrenewable.com>; Osborne, Michael <michael.osborne@brookfieldrenewable.com>; kelly.maloney <kelly.maloney@brookfieldrenewable.com>; Dill, Richard <Richard.Dill@brookfieldrenewable.com>; Farrington, Stephen <Stephen.Farrington@brookfieldrenewable.com>; Michaud, Steve <Stephen.Michaud@brookfieldrenewable.com>; Stevens, Nate <Nathan.Stevens@brookfieldrenewable.com>; Mapletoft, Thomas <thomas.mapletoft@brookfieldrenewable.com>; Macomber, Lance <Lance.Macomber@brookfieldrenewable.com>; Dorman, Randy <Randy.Dorman@brookfieldrenewable.com>; Pelletier, Julie <Julie.Pelletier@brookfieldrenewable.com>; Dunham, Kevin <Kevin.Dunham@maine.gov>; Rosset, Julianne <julianne_rosset@fws.gov>; Sojkowski, Bryan <bryan_sojkowski@fws.gov>; Obrey, Tim <Tim.Obrey@maine.gov>; Shores, Kelly <Kelly.Shores@maine.gov>; Goodmen, Ruby <Ruby.Goodmen@maine.gov>; amanda_cross <amanda_cross@fws.gov>; Gallant, Kevin <Kevin.Gallant@maine.gov>; Brautigam, Francis <Francis.Brautigam@maine.gov>; Mohlar, Robert C <Robert.C.Mohlar@maine.gov>; DiFranco, Jeanne L <Jeanne.L.DiFranco@maine.gov>; Bacon, Linda C <Linda.C.Bacon@maine.gov>; Perry, John <John.Perry@maine.gov>
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Kathy – thank you for your response. Below (in red) is GLHA's answer to your question.

Kevin

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| | |
|---|---|
| **From:** | Bernier, Kevin |
| **To:** | Howatt, Kathy |
| **Cc:** | Cole, James; Osborne, Michael; Maloney, Kelly; Dill, Richard; Farrington, Stephen; Michaud, Steve; Stevens, Nate; Mapletoft, Thomas; Macomber, Lance; Dorman, Randy; Pelletier, Julie; Dunham, Kevin; Rosset, Julianne; Sojkowski, Bryan; Obrey, Tim; Shores, Kelly; Goodmen, Ruby; amanda_cross; Gallant, Kevin; Brautigam, Francis; Mohlar, Robert C; DiFranco, Jeanne L; Bacon, Linda C; Perry, John |
| **Subject:** | RE: Minimum flow reduction proposals for Ripogenus and Millinocket |
| **Date:** | Wednesday, March 2, 2022 8:15:00 AM |

Kathy – thank you for your response. Below (in red) is GLHA's answer to your question.

Kevin

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Kathy Davis Howatt
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**To:** Dunham, Kevin; Rosset, Julianne; Sojkowski, Bryan; Obrey, Tim; Shores, Kelly; Goodmen, Ruby; amanda_cross; Gallant, Kevin; Brautigam, Francis; Mohlar, Robert C; DiFranco, Jeanne L; Bacon, Linda C; Perry, John; Olcott, Kyle
**Cc:** Cole, James; Osborne, Michael; Maloney, Kelly; Dill, Richard; Farrington, Stephen; Michaud, Steve; Stevens, Nate; Mapletoft, Thomas; Macomber, Lance; Dorman, Randy; Heidrich, David
**Subject:** RE: Minimum flow reduction proposals for Ripogenus and Millinocket
**Date:** Monday, April 18, 2022 12:11:00 PM
**Attachments:** image002.jpg

Just a quick update that the West Branch of the Penobscot River reservoirs have refilled nicely with the minimum flow reductions implemented at the Ripogenus and Penobscot Mills Projects in early March and from spring runoff, so GLHA will be returning to normal operations at the Projects beginning later today. Thank you for your cooperation with these water management actions, which were made in response to the drought and low water level conditions we've experienced on the West Branch over the last couple of years.

**Kevin Bernier**
Senior Compliance Specialist

**Brookfield Renewable**
1024 Central Street, Millinocket, ME 04462
**C** 207 951 5006
kevin.bernier@brookfieldrenewable.com
www.brookfieldrenewable.com

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# Attachment B

Kimberly D. Bose, Secretary
March, 9 2022
Federal Energy Regulatory Commission
888 First Street, N.E. Room 1A
Washington, DC 20426
Filed Electronically

**Ripogenus Hydroelectric Project (FERC No. 2572), Yet Another West Branch of the Penobscot River Flow Violation Below McKay Station**

Recently, March 5th or 6th, 2022, West Branch of the Penobscot Rivers flows below McKay Station (West Branch) were reduced to 860 CFS. This flow violates a license minimum flow requirement of 1000 cfs as well as violating a spawning and incubation flow requirement of 1300 cfs. While the severity of environmental impacts of this dramatic flow reduction are unknown at this time, landlocked salmon (salmon) spawning success is threatened and aquatic communities' abundance further reduced. This most recent minimum flow violation by Great Lakes Hydro America is the most ecologically dramatic of the many 2021-2022 West Branch flow transgressions.

The Licensee's Pre-Application Document (PAD) proudly makes frequent reference to protection, mitigation, and enhancement (PM&E) measures. These measures were implemented by Great Northern Paper as part of the 1996 FERC license and for the most part have not been reevaluated in 20 plus years. The exceptions are lake level and flow management, so called, PM&E measures. The 2021 draining of the Ripogenus Impoundment and the dewatering of the West Branch, with the March 5, 2022 event being the most lethal, were obvious to all project visitors e.g., anglers, boaters, camp owners, campers, sightseers, etc. As the Licensee takes full credit for PM&E measures in the PAD, they must assume full responsibility for their actions when PM&E measures fail resulting in catastrophic biological loses e.g., loss/alteration of impoundment littoral zones,

the failure to provide suitable McKay Station flows resulting in the loss of flow into the Holbrook Bypass channel that was designed to support salmon spawning, incubation, and nursery life stages (Article 406), serious flow reduction and loss of downstream salmon spawning, incubation and nursey areas, and the loss of macro invertebrates communities abundance, function and diversity.

The Ripogenus license states*; Article 402 of the existing license requires minimum flows downstream of McKay Station into the West Branch as specified in Table 4.4-1. These flows may be temporarily modified if required by operating emergencies beyond the control of the Licensee and for short periods upon agreement between the Licensee and the Maine Department of Environmental Protection (MDEP) and Land Use Planning Commission (LUPC). Minimum flows may also be modified (to outflow approximates inflow) if required by hydrologic conditions beyond the control of the Licensee upon mutual agreement between the Licensee, USFWS, MDEP, LUPC, and MDIFW. Consistent with the August 19, 1997 FERC order approving and modifying the Water Management Plan, changes in flows below McKay Station are accomplished through the turbines; however, if necessary, GLHA will open a gate at Ripogenus Dam to augment flows.*

The key component of the above Article is: *hydrologic conditions beyond the control of the* licensee. Beginning in May 2021, the licensee had total control of Ripogenus storage as well as upstream storage in the Licensee's storage Project (P-2634). The Licensee's computer monitoring surely demonstrated falling lake levels with reduced inflow and weather forecasts provided little hope of significant precipitation. In managing storage, the licensee also chose to ignore Great Northern Paper's Water Management Plan. The use of 38 plus Billion Cubic Feet of useable storage including tributary inflow was a business decision designed to maximize energy production and profit. The licensee did so and depleted storage with total disregard of environmental needs. Fish, aquatic communities as

well as recreationalist paid the price and will continue to pay the price (in lost salmon reproduction) in 2022 and beyond.

The 1996 FERC Ripogenus License was based in part on the value of West Branch salmon fishery and “relatively stable base flows”. These conditions no longer exist. The 1996 license also provides some flow modification flexibility, however the licensee is required to consult with the resource agencies e.g., Maine Department of Inland Fisheries and Wildlife, the US fish and Wildlife Service and Maine Department of Environmental Protection. There are no FERC E-library filings that suggest possible consultations occurred. Another in a series of Ripogenus Project license violations that resulted in continuing environmental degradation.

If license conditions are to be meaningful, FERC needs to respond to the licensee’s continued disregard for conditions, guidelines and goals set forth in the 1996 FERC License. FERC must hold the licensee responsible for operational decisions, e.g., peaking, and high base flows, made when it was clear that no storage would be available to meet fall and winter environmental goals. FERC can not allow the Licensee to act as it pleases, the environmental communities will not survive, or survive in the manner described in the 1996 Environmental Impact Statement. Fish, aquatic communities and anglers need to be considered.

Thank you for the opportunity to comment.

Ed Spear
307 Mt Hope Ave.
Bangor, Me 04401
Phone; 207-217-4288
Email: edspear1@yahoo.com
CC: Alicia Burtner via email

# Attachment C

March 13, 2022

Kimberly D. Bose,
Secretary Federal Energy Regulatory Commission First Street, N.E.
Washington, D.C. 20426

Subject: Ripogenus Project (FERC No. 2572); Minimum Flow Reductions Comments

Dear Secretary Bose:

I am writing in response to the letter submitted March 9, 2022 by Kevin Bernier of GLHA regarding minimum flow reductions in the Ripogenus Project. I greatly appreciate GLHA evaluating snowpack and recognizing the amount of water released from Ripogenus dam needed to be modified to support future water releases. In their letter, GLHA presents the drought as the sole cause of the current problem.

They claim, " *licensee for the Ripogenus (FERC No. 2572) and Penobscot Mills (FERC No. 2458) Projects, has been implementing water conservation measures on the Upper Penobscot since the current drought intensified beginning in 2020*," and provide the following as evidence of water conservation efforts:

> *1. The Canada Falls, Seboomook, Caucomgomoc, and Ragged Lake Developments have been largely operating at minimum flow, or at a reduced minimum flow developed through agency consultation, since the current drought began in 2020.*
>
> *2. Through agency consultation, the Ripogenus spawning and incubation flows (which are required from October 15th – June 7th) have been set at 1,300 and 1,100 cfs in 2020 and 2021 respectively, much lower than the 1,700 cfs flow that had been set annually the previous 7 years. GLHA has not deviated from the current 1,100 cfs minimum flow since it was set in October.*
>
> *3. Ripogenus flows have been routinely reduced during non-rafting hours (i.e., from 5:00 p.m. to 8:30 a.m.) to conserve water storage in the Ripogenus impoundment.*

I applaud these efforts, although I question the claim of reduced releases during non-rafting hours. Our experience on the lake and rivers has not reflected "routinely reduced flows during non-rafting hours." Throughout July and August of 2020 and 2021 we often saw releases above the minimum required and well beyond hours required. An example of daily releases is represented in the chart below, which is a screen shot from Brookfield's Water Flow site in August of 2021:

AS OF SAT AUGUST 14 11:41AM EDT

Total Flow 3100 cfs

## SHORT-TERM SCHEDULE

| START DATE | START TIME | END DATE | END TIME | CFS |
|---|---|---|---|---|
| 8/11/2021 | 8:00 AM | 8/11/2021 | 9:00 PM | 3,000 |
| | 9:00 PM | 8/12/2021 | 8:00 AM | 1,800 |
| 8/12/2021 | 8:00 AM | 8/12/2021 | 5:00 PM | 2,200 |
| | 5:00 PM | 8/12/2021 | 9:00 PM | 3,400 |
| | 9:00 PM | 8/13/2021 | 8:00 AM | 1,800 |
| 8/13/2021 | 8:00 AM | 8/13/2021 | 12:00 PM | 2,000 |
| | 12:00 PM | 8/13/2021 | 5:00 PM | 3,000 |
| | 5:00 PM | 8/13/2021 | 9:00 PM | 3,400 |
| | 9:00 PM | 8/14/2021 | 8:00 AM | 1,800 |
| 8/14/2021 | 8:00 AM | 8/14/2021 | 5:00 PM | 2,200 |
| | 5:00 PM | 8/15/2021 | 8:00 AM | 1,800 |
| 8/15/2021 | 8:00 AM | 8/15/2021 | 5:00 PM | 2,200 |

As the Short-Term Schedule indicates, water was generously released during non-rafting hours far exceeding minimum requirements. Rafting releases were also beyond minimum license requirements as explained by GLHA, "*Project license requires that minimum whitewater recreation flows of between 2,000 and 2,300 cfs be released from the Project between 0830 and 1700 hrs. on a daily basis.* ***In a "dry" hydrologic year (such as 2021), the required minimum flows are 2,200 cfs on Saturdays and Sundays, 2,000 cfs on Mondays and Fridays, and 1,800 cfs on Tuesdays through Thursdays.*** *During other hours of the day* ***outside of the whitewater release time period (i.e., 1700 to 0830 hrs), requires a minimum flow of 1,000 cfs*** *from June 8th through October 14th.*

Analysis of the Scheduled Flow Chart clearly demonstrates releases exceeding minimum requirements by as much as 2400 cfs. Releases between 1700 to 0830 hours exceed minimum flows by at least 800 cfs. If flows *"set at 1,300 and 1,100 cfs in 2020 and 2021 respectively,"* are *"much lower than the 1,700 cfs flow that had been set annually the previous 7 years"* are recognized as an important water conservation effort, certainly flows of 800 -2400 cfs beyond minimum requirements are recognized as significantly excessive.

There is no question lake levels are low and dramatically impacted by the drought. It is important GLHA and all of the stakeholders recognize the low water levels are also the result of project operations. GLHA states, *"Recent surveys in the upper Penobscot drainage have shown average*

*water content in the snow to be about 20% below the long-term average. In addition, water levels are currently much lower than normal in both the Ripogenus (almost 22 feet below full pond) and North Twin (almost 8 feet below full pond) impoundments.*" Twenty percent below average snowpack does not result in Ripogenus Impoundment being 22 feet below full lake – excessive water releases in a time of drought does.

In their letter, GLHA explains the reduced flows, "*are the same minimum flows implemented as the result of the most recent (2001 – 2003) extended severe drought in Maine."* We purchased our camp in 2003, and spent a large amount of time in the fall of 2002 on the lake deciding to make the purchase. At that time, despite a severe drought, the lake levels were not nearly as low as they are now, as evidenced by the fact that we were able to park our boat on the first mooring, something that has quickly become impossible in recent early summers. Family pictures show the lake in the fall of 2002 and spring of 2003 much higher than lake levels in recent years.

The purpose of this letter is to provide both anecdotal and empirical evidence that the low lake levels are not only the result of the drought, but that the problem has been exacerbated by operational practices. My hope is that this will provide the Commission with a clearer understanding of what is truly happening on the waterways. I also hope GLHA will acknowledge how operations have contributed to the problem so mistakes can be corrected, and future operations can be modified and improved.

Ten years of historical operations data has been requested by nearly all NGOs and government agencies involved in this process. The data exists. Within this data lies the facts necessary to make informed, accurate decisions, as recent events illustrate.

Relicensing these dams is a colossal undertaking that can only be done with an honest, accurate understanding of the realities of the situation, and with all parties involved engaged in good faith, cooperative efforts. FERC has the immense responsibility to balance the needs of all stakeholders involved. This can only be done with a complete and accurate picture of what dam operations have been over the current owners tenure, and the impacts of those operations on the rivers and lakes, fish and wildlife, and recreational users.

Thank you for your time and consideration.

Sincerely,
Kathleen K Houston
PO Box 145
Kingfield, ME 04947
khlally14@gmail.com

# Attachment D

Kimberly D. Bose
April 27, 2022
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426 Via Electronic Filing

Re: The Ripogenus and Penobscot Mills Projects P-2572 and P-2458

Great Lakes Hydro America's failure to meet 401 Water Quality Certification Articles and Protection, Migration and Enhancements Measures during 2021.

Great Lakes Hydro America (the Licensee) initiated the Licensing of the Ripogenus (P2572) and Penobscot Mills (P2458) Projects on June 8, 2021. During this process the Licensee has submitted numerous filings that demonstrate their failure to follow 401 WQC prescriptions. Additionally, the licensee has ignored measures suggested in the 1996 EIS and then listed them in the Preliminary Application Document (PAD) as Protection, Enhancement and Mitigations (PE&M) measures. The Licensee needs to be held to both legal standards and enhancement measures so often referred to in the PAD and subsequent filings. Stating that nothing has changed and "everything is great", simply is not supported by the March 23, 2022 "flow and elevation" filing and the Maine Department of Inland Fisheries and Wildlife's (MeDIFW) Chesuncook lake (Ripogenus Impoundment) October 8, 2021 filing. I contend that the Licensee needs to correct operating procedures that clearly violate 401 WQC articles or contradict PE&M statements made in the PAD. This filing requests that FERC immediately take the necessary actions to correct present and future operations that are impacting fish and aquatic communities and angler use and success in the Ripogenus Impoundment and all reaches of the West Branch. The areas of concern are;

- Article 402 – Ripogenus Project, Upper Gorge July-September 30 flows
- Article 406 - Ripogenus Project, Holbrook Bypass Channel Salmon Spawning and Nursery Flows
- Article 408 – Penobscot Mills Project, Irregular Flows
- Article 413 -Millinocket Stream, Spring and Fall Brook Trout Stockings

! The Use of the Water Management Plan

Upper Gorge:

Former MeDIFW Regional Biologist, Paul Johnson filed (October 8, 2021) comments on the PAD, noting that the licensee's present practice of providing surface flow into the Upper Gorge were not meeting the objective of Article 402, section 401 of the Clean Water Act. MeDIFW echoed this concern in its October 8, 2021 filing.

> "*It was the intent of MDIFW that the flows in the Upper Gorge would originate from a deep gate and provide a cool water attraction flow as adult salmon reached the upper river in July. However, the water is released from a sluice (surface) gate which is warm water. This water is warmer than the water passing through McKay Station into the river and is therefore ineffective as an attraction flow*."

Brookfield Renewable Energy/ Great Lakes Hydro America is a competent and well-run organization. During *due diligence* the Licensee surely became aware of goals and operating necessities required by License articles and PM&E measure presented in the 1996 EIS and the resulting FERC license. Still, despite complaints and study requests, the Licensee continues to ignore issues raised in numerous stakeholder filings and a very reasonable MeDIFW request has been ignored. However, this "pales in comparison" to the fact that the Licensee's lists the Upper Gorge flow as a PM&E measure when recent Upper Gorge flows are by surface discharge. The resulting flow act as a salmon repellent rather than an attraction flow. The existing Upper Gorge flow regime is exactly opposite of the MeDIFW request.

In recent years, the July 1 -September 30 period, flows into the Upper Gorge were 90 cfs of surface water though a "log sluice" gate. The assumption was that the remaining flow needed to meet the 100 cfs requirement was from leakage (12 Cfs recorded during a full pond 1991 measurement). However, the license says release. This implies an action, in this case, opening a gate. Leakage is passive and beyond control of the licensee and in fact, there are no current data reporting the amount of (any) leakage and change in (any) flow volume as the Ripogenus Impoundment head is reduced.

The present licensing schedule appears to be delayed and field collections are unlikely to be initiated by May 1, 2022. Another year's delay and another year of continuing impacts. During this transition period FERC can act to bridge the gap, by ordering the Licensee to either provide Upper Gorge flow through a deep gate or by requiring the Licensee to siphon off water (say 10-15 cfs) from below the McKay Station intake structure, say 55 feet below full pond elevation. Either method will reduce the Upper Gorge stream flow temperature. A return to the initial MeDIFW goal and conditions of Article 402 is a simple operation.

.Holbrook Bypass Channel:

The Holbrook Bypass Channel, Article 406, was designed at the request of MeDIFW in order to mitigate for the lack of young-of-the-year (YOY) salmon habitat in the West Branch below McKay Station. Two intake pipes were buried under a rocky berm along the northeast side of Holbrook Pool. One pipe with an adjustable valve, allowed for flows of 35 (June 1st) or 65 cfs (October). Mandated monitoring studies required in Article 406 and conducted during the years of "relatively stable base flows" determine that this mitigation measure was a success. Adult salmon spawned in the bypass channel and subsequent YOY production was excellent in earlier years. Monitoring studies ended in 2001.

During the summer and fall of 2021, low McKay Station flows resulted in reduced flow into the bypass area. On September 14, 2021 Licensee's staff photographed the upper Bypass Channel at a reported station flow of 1000 cfs (see the Licensee's September 30, 2021 filing). The two pictures show a flow that lacks surface turbulence and riffles, conditions needed for optimum YOY salmon production. Looking downstream from the intake gates, a long, flat stretch with an "unbroken" surface is apparent. Such waters are not suitable for YOY salmon and salmon production is lost or reduced under a 1000 cfs flow regime.

By November 2021, Holbrook bypass low flows became effectively no flow, and this very limited flow was not suited to spawning AND overwintering survival of eggs. The 2020 spawning year class and resulting 2021 salmon YOY production was lost during late summer and early fall low flow events. Then November 2021 salmon spawning was lost due to fall and (2022) winter dewatering, this will result in NO 2022 salmon YOY production. Two years of Article 406 mitigation lost and the West Branch salmon population will suffer in the coming years. While 2021 was a "dry

year", the Licensee was in complete control of Ripogenus storage and McKay Station Flow. On May 15, 2021 the Ripogenus Impoundment elevation was 933.77 (see March 23, 2022 filing) or about 23 BCF, the upstream Storage Project (P-2634) presumably in full license compliance, contained another 9 BCF. An additional 8+ BCF of inflow would eventually contribute to storage during the May 15-September 15 period. The resulting 40 BCF was enough water to meet both hydroelectric and PM&E measures. Instead, the Licensee chose to generate and drain the Ripogenus Impoundment, and eventually the West Branch, rather than meet PM&E measures so often cited in the PAD and subsequent filings. The FERC compliance section should require the Licensee to meet the WQC Article 406 condition as well PM&E measures it now boasts of so frequently.

Daily low evening flows e.g., 1000 cfs, not only impacted the above referenced salmon nursey area (both in the bypass and in downriver areas) but aquatic communities, fisheries and angling opportunity. The foundation of the 1992 Ripogenus Project License Application was "relatively stable base flows" and the accompanying "two wheel" (turbine) 2000 cfs flow when Mill energy demands were low. This was an environmentally proven mode of operation. The fishery below McKay Station was a "world class" fishery. MeDIFW referred to this river section as a "Destination Fishery". FERC now has an opportunity to protect the fish and aquatic insects below McKay Station by requiring the licensee to adhere to article 406 standards. Mandating McKay Stations discharges that provide a June 1st flow of 35 cfs into the bypass stream will meet multiple goals including downstream fish and aquatic communities' needs.

Penobscot Mills Project Flows

The 1996 License was based on Great Northern Paper's historical relatively stable West Branch base flow operations. It appears that the Licensee has changed from historical operations into a peaking mode in waters downstream of North Twin Dam and extending to the Medway Impoundment. For example, during August 12 and 13 of 2021, North Twin Dam outflows peaked at 3943 cfs before returning to the licensed minimum of approximately 2000 cfs (the Licensee's March 23,2022 filing). These peaking events appeared in other years and all other facilities. While well within the license WQC conditions, such flows are not "relatively stable" and impact fisheries and aquatic communities. The Licensee has yet to file the

requested hourly flow and elevation records for each facility. These records should be made public. A review of licensee' March 23, 2022 filing of *Daily operations data* listing "min.station" and "max.station" records indicate that there were numerous peaking flows events but the time frame is unknown. Minimum and maximum station flow differentials of 1000-1400 cfs were common below all facilities. FERC should require that the Licensee provide the requested hourly flow information, these data will demonstrate any daily flow fluctuations in response to energy demands.

During low flow periods, the West Branch provides much of the mainstem Penobscot River's flow, perhaps 90%. Thus, flow management of the West Branch (Penobscot Mills Project) impacts down river fisheries and aquatic habitat downriver of the Weldon Station (Mattacecunk Project P-2520). The entire mainstem Penobscot River below Weldon Station is considered critical habitat for the federally listed Atlantic salmon. The USGS West Enfield flow records, when viewed in graphical form, suggest upstream peaking events. The impact(s) of Penobscot Mills Project flow management on critical Atlantic salmon habitat in the mainstem Penobscot River should be considered.

Millinocket Stream, brook trout stocking

Article 413 requires *"The licensee shall implement an upgraded spring and fall brook trout stocking program to provide a seasonal fishery in Millinocket Stream. Each stocking shall consist of about 500 fish ranging in size from 1/3 to one pound,…."*.

Initially, Millinocket Stream hatchery brook trout were supplied by a private source rather than a public source, MeDIFW**.** A review of MeDIFW stocking records dating back to 2010 revealed that the licensee has been unable to meet Article 413 requirements in the last 11 years. The Licensee has consistently failed to meet the "spring and fall brook trout requirements" as spring stockings of trout "*1/3 to one pound*" have not occurred. The 2021 stocking of small, but catchable, 10 inch trout was an improvement but still failed to meet WQC Article 413 requirements. There were also a number of May stockings, when two inch fry were stocked. These efforts also failed to meet Article 413 requirements. Stocking brook trout fry in Millinocket Streams makes no biological sense. The reason for stocking brook trout fry is unclear. This alarming failure to meet an important

Article 413 mitigation measure was not revealed in any of the Licensee's frequent filings. I urge FERC to correct this licensee violation by requiring the Licensee to stock "*1/3 to one pound*" brook trout in the spring.

The Use of the Water Management Plan:

The Licensee has mostly ignored the 1996 Water Management Plan (WMP) and arbitrarily set up its own water management plan; a peaking operation driven by the market for electric power that conflicts with environmental needs. Circa 1990, Great Northern Paper hired highly credentialled Dr Nathan Burris PhD to develop a Water Management Plan that evolved into a Water Use Plan (WUP) for the West Branch drainage. The WUP was used in the early years of the current license but may have been abandoned by the Licensee. I say "may" because the licensee sometimes claimed to follow their own water management scheme while at other times referring to the WUP. The best and perhaps only example of "picking and choosing" water management guidance, the WUP, or using their own mysterious water management plan that ignores stated license goals is found in a footnote to Table 4.4-1 of the PAD;

*"The whitewater flow for each month from May through September is determined on the first day of each month based on an analysis of Total Available Water as described in the Water Use Plan in the application for new license filed with the Commission on December 17, 1991"*

There are no upper flow limit associates with "whitewater flow" releases. The March 23, 2022 flow spreadsheets demonstrate that during 2021, the Licensee routinely operated in a peaking mode, e.g., 3000 cfs, during periods before, during and after boaters were on the river. Market driven energy needs for peaking are simply called "Whitewater flows". MeDIFW questioned water management in its October 10, 2021 filing, questioning 3000 cfs flows during draught conditions*. "MDIFW observed on several occasions in the winter and summer of 2021 that the Licensee was indeed running in excess of 3,000 cfs when lower flows were required by the license;*". By August 2021 Ripogenus Impoundment storage was clearly being rapidly depleted and many PM&E measures threatened. Still the Licensee continued to operate in a peaking mode. The WUP, including "*an analysis of Total Available Water as described in the*

*Water Use Plan"* referenced in the PAD, was clearly arbitrarily ignored in the summer of 2021.

The PAD states that the licensee measures snow in late February/early March and uses the result to "manage" storage. The relevance of "snow depth" is not clear. The critical factor relating to potentially available storage, is water content in the snowpack. Equally bewildering, is the apparent lack of knowledge of the North Branch and South Branch (hydraulically controlled by the Canada Falls facility) USGS monitoring stations and the unwillingness to use real time inflow data. A review of the 2021 USGS North Branch station and to a lesser degree the (hydraulically controlled) South Branch Station flow data provides clear and irrefutable evidence that the Licensee violated the "or inflow" provision of the Ripogenus' s Project Article 406 during the late summer and early fall of 2021.

"*The 1991 Water Use Plan (i.e., the licensee's proposed operation alternative) was developed prior to issuance of the Projects' existing licenses and was the basis for the operational requirements included in the Projects' 1996 FERC Licenses. However, as compared to the Water Use Plan, the Projects' current operations are defined by the requirements of the Projects' licenses. Therefore, the 1991 Water Use Plan is not a "management plan" consistent with other management plans resulting from a relicensing proceeding"* (PAD 1-12).

The above quote is simply the Licensee's opinion. Other than the obvious change to a peaking operation (that the Licensee has yet to acknowledge), the Licensee provides no explanation of the above statement. I have seen no FERC filings where the Licensee has filed statements concerning abandonment of the FERC license guidelines. The change in operation was a deliberate business decision to maximize generation. In the PAD the Licensee states "*Therefore, the 1991 Water Use Plan is not a management plan consistent with other management plans resulting from a relicensing proceeding*." The WUP is the foundation of the 1996 Licenses. FERC, in the 1996 EIS, found the WUP compatible with existing fish and aquatic communities and "boating" needs while at the same time meeting other required PM&E measures. The Licensee implies nothing has changed but then states in the PAD that the WMP is no longer valid. So, what has changed to the degree that the WUP is not "consistent with other management plans"? The Licensee referenced water management frequently and boasted about it as a

PM&E measure. Thus, it is obvious that the Licensee has some type of a water management plan with starting and ending points. However, “generate and drain” is not a water management plan as the end points are a dry impoundment and an environmental disaster. It is time for the Licensee to share the parameters used in managing storage and flow in all project waters with the agencies, stakeholders and FERC.

It is time to develop a new Water Management Plan. MeDIFW in its October 8, 2021 filing echoed a similar sentiment, *“We view this upcoming relicensing process as an opportunity to review and fine tune the water management for the Ripogenus Project.”* Simply stated, at this time, there is simply no peer reviewed water management plan for the West Branch for the West Branch between McKay Station and the Medway facility. In its frequent filings, the licensee constantly talks of water management and then demonstrates that none exist. It is obviously that in the case of fisheries, aquatic communities, loons, camp owners and boaters, their needs were not considered during 2021 and other years. The West Branch River system is out of balance. As soon to be mandated 2022-2024 studies are completed, a list of competing needs will be developed. In order to balance the needs of various users, FERC staff will require information on available storage and flow requirements. Without a peer reviewed water use plan, FERC staff’s task will be impossible.

Despite the Licensee’s warning of another “dry year” in its March 9, 2022 filing, heavy rains have greatly improved storage conditions and the impoundments are filling or already full. To those of us involved in this licensing(s), we are happy to see the Licensee enjoy an apparent (at this time) “wet year”. Wet years are good for hydroelectric generation, and even better for fish and aquatic communities. A win for all parties. Still, environmental concerns remain. As an interim measure, I urge FERC to require that Holbrook bypass flows be maintained as envisioned by Article 406. This can be accomplished by ordering that minimum McKay Station operating flows be set between 2000 -2200 cfs. I also request that FERC implement MeDIFW’s ramping request (October 8 2021 filing) of a 25% change per hour outflow below all project facilities. Ramping rates are common to all new FERC licenses/401 WQCs and the Licensee is required to ramp at Caucomgomoc Lake Dam (P-2634), Stone Dam (P-2572) Article 412 (7), and the Magpie River (Ontario, CA) to name a few facilities. A new license is at a minimum four years

away. The ongoing impacts to fish and aquatic communities needs to be corrected. Current project operations are out of balance, heavily skewed to power generation. Requiring the Licensee to adhere to the many license articles and PM&E measures it so often boasts of would be a good start.

Thank you for the opportunity to comment on the many license violations that resulted from Licensee's 2021 operations of the Ripogenus and Penobscot Mills Projects.

Ed Spear

307 Mt Hope Ave.
Bangor, ME 04401
Email: edspear1@yahoo.com
Phone (207) 217-4288

**Attachment E**

Brookfield Renewable

April 27, 2022

***Via Electronic Filing***

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Response to Stakeholder Comments on Revised Study Plan**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), a subsidiary of Brookfield Renewable and Licensee of the Ripogenus Hydroelectric Project (FERC No. 2572) and the Penobscot Mills Hydroelectric Project (FERC No. 2458) (collectively referred to as the "Projects"), herein files with the Federal Energy Regulatory Commission ("FERC" or "Commission") responses and clarifications to select stakeholder comments on the Revised Study Plan (RSP) for the relicensing of the Projects. The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot Counties, Maine.

On June 11, 2021, GLHA filed the Notices of Intent and Pre-Application Document (PAD), which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through the Commission's Integrated Licensing Process (ILP). Subsequently, FERC issued Scoping Document 1 (SD1) on August 10, 2021, and held daytime and evening virtual scoping meetings on September 9, 2021.[1] Additionally, on the afternoon of September 9, 2021, GLHA hosted a virtual environmental site review. On November 22, 2021, FERC issued Scoping Document 2 (SD2). Also on November 22, 2021, GLHA filed a single Proposed Study Plan (PSP) for the Projects. GLHA hosted a two-day virtual PSP meeting on December 15 and 16, 2021. On March 23, 2022, GLHA filed a RSP for the Projects.

Via letter dated April 1, 2022, the National Marine Fisheries Service (NMFS) requested an extension of time to file comments on the RSP. Via letter dated April 7, 2022, FERC approved an extension of time until April 28, 2022, for stakeholders to file comments on the RSP and until May 13, 2022, for FERC to issue the Study Plan Determination for the Projects. Given these extensions of time, GLHA is providing clarifications and responses to select stakeholder comments regarding the RSP. GLHA believes that this additional information will provide stakeholders with additional needed information and support the Commission's development of the Study Plan Determination.

[1] As specified in SD1, the Commission did not conduct in-person public scoping meetings or in-person environmental site reviews due to concerns with COVID-19.

Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462
www.brookfieldrenewable.com
Tel: 207.723.4341
Fax: 207.723.3948

**April 1, 2022 Letter filed by American Whitewater and Appalachian Mountain Club (AW-AMC)**

**AW-AMC Comment on Whitewater Boating Assessment Study**

Specific to the West Branch Below Stone Dam, SD2 and the comments of AW, AMC and Maine Department of Conservation, Division of Parks and Public Lands on the PSP requested that the West Branch below Stone Dam be assessed to adequately evaluate the needs and opportunities related to this resource for whitewater boating and other recreation. In the RSP, related to Stone Dam in section 5.0, AW and AMC believe the licensee is seeking to justify their lack of interest in following the Whitaker 2005 methodology by arguing that flows needed for such an analysis cannot be provided. AW and AMC find this assertion to be unclear and inconsistent with other publicly available information related to the operating parameters of the Stone Dam.

Though the licensee claims that the inflatable flashboards that have replaced the old gate structures at Stone Dam prevent the licensee from conducting a controlled flow study in this reach, AW and AMC find this contradictory to filings on this project to the Low Impact Hydropower Institute in their application and the reviewer's report in that docket (https://lowimpacthydro.org/lihi-certificate-167-millinocket-dolby-hydroelectric-project-maine/). Regarding the Stone Dam inflatable structure, the LIHI docket notes that Stone Dam may be used to attain the 2,000 cfs minimum flow downstream of the Millinocket Project when the Millinocket project is offline. The LIHI docket notes that, "*During periods of high seasonal flows or whenever abnormal conditions occur such that turbine flow [at the Millinocket Project] cannot be passed to achieve the 2,000 cfs minimum flow, the pneumatic rubber flashboard system [at Stone Dam] is deflated to release flows in an expeditious effort. When this occurs, a two-minute siren warning is initiated and a safe flow of 200 cfs is released for fifteen minutes. Increases of 400 cfs per hour are made until either the required downstream flow is met, the elevation at Stone Dam falls to 459.45 ft msl or the pneumatic rubber flashboard system is fully deflated. The ramping down of flows in the Back Channel is initiated once turbine hydraulic capacity is restored or seasonal flows start returning to normal.*" Provided that this information is accurate, it appears that Stone Dam can be operated in such a manner to assess whitewater paddling with an on-water component as part of the study if deemed necessary after Whitaker Level 1 study through single flow or multiple flow on-water study. This should be corrected in the Study Plan Determination.

**GLHA Response**

GLHA has reviewed the above-referenced information from the LIHI docket regarding the operation of the pneumatic rubber flashboard system at Stone Dam and provides clarifying information herein.

GLHA notes that LIHI docket information is consistent with the Water Management Plan for the Penobscot Mills Project, filed for Commission approval on April 9, 1997. The plan had been prepared in accordance with License Articles 401, 402, 403, 404, and 408 and was approved by Commission order on September 3, 1997.

The pneumatic flashboard system at Stone Dam is operated in support of public safety and to address abnormal operations (e.g., unplanned outages). Whereas GLHA operates the pneumatic flashboard system as such, it should not be interpreted that sufficient control of flows from Stone Dam exists to support a controlled flow study.

Minimum flows are released from Stone Dam using a procedure that incorporates ramping to avoid public safety concerns associated with an abrupt increase in flows downstream of Stone Dam. To provide the approximately 200 cfs public safety ramping release from Stone Dam, the control center partially deflates the pneumatic flashboard system. Prior to and during this deflation, the control center sounds the public safety siren for 6 minutes to notify downstream users of the increased flow entering the stream channel. During the public safety ramping release, the control center also observes via cameras the water flowing over the pneumatic flashboard system for the 15-minute duration to visually verify the deflation and estimated flow.

While the pneumatic flashboard system has a general gate discharge curve associated with it, the system, unlike pneumatically actuated gate systems, does not deflate consistently and, as such, does not release precise outflows. Although the pneumatic flashboard system at Stone Dam cannot release precise outflows, it is manually adjusted (as there is no automatic control) by the control center to maintain a stable head pond in compliance with the Penobscot Mills FERC license. As a result, the pneumatic flashboard system at Stone Dam is not capable of consistently providing the precise or sustained flows necessary for conducting a controlled flow study in this reach.

**AW-AMC Comment on Recreation Study**

Though AMC and AW appreciate the inclusion of a recreation user intercept surveys in the study methodology, we request that the study methodology also include an online survey, input from a stakeholder working group, and key person interviews with organizational representatives from user groups, representatives of camp owners and other recreation related interests, such as outfitters. It is not practical for our organizations or, for example, a camp owner on one of the lakes, rivers, or upland areas to be expected to travel to a FERC-approved recreation site to complete the survey, nor does the survey instrument speak to the feedback of these audiences as a broader representation of the needs, opportunities and issues that would be brought forward by these audiences.

**GLHA Response**

GLHA would like to clarify that the proposed study includes an online version of the recreation user survey. The survey boxes that GLHA will be deploying at each of the Project recreation sites will be displaying a QR code which, when scanned with a cell phone, can be used to find an online version of the recreation user survey. This method has been used effectively at numerous other hydropower projects and is a good way to provide online access to the survey.

Regarding the availability of the recreation user survey (or the QR code to complete the survey online) by those accessing the Project impoundments from locations other than the Project recreation sites, GLHA notes that the recreation user survey is focused primarily on understanding how the FERC-approved Project recreation sites are being used, and whether the facilities and amenities provided at the sites are functioning well and meeting their intended purpose. For this reason, it is appropriate to provide the surveys and QR code for online survey access at the Project recreation sites. That said, in their comments on the RSP, the Bureau of Parks and Land (BPL) asked how users of the remote campsites will be surveyed. To address this concern, GLHA will work collaboratively with BPL to install additional survey boxes at the boat launch locations indicated by BPL that are primarily used to access the remote campsites on the Ripogenus impoundment.

**April 7, 2022 Letter filed by Maine Department of Environmental Protection (MDEP)**

**Comment on Fish Assemblage Study**

In its comments on the Proposed Study Plan, the Department requested a Fish Assemblage Study that would be used to demonstrate, in part, whether the Projects meet applicable water quality standards. Specifically, the impounded waters must support all species of fish indigenous to those waters. The results of the Fish Assemblage Study would also be used as evidence that could demonstrate attainment of the designated use of habitat for fish and other aquatic organisms.

In the RSP, Great Lakes does not adopt the Department's requested Fish Assemblage Study, and instead proposes to conduct a Fishery Assessment as part of the Impoundment Aquatic Habitat Assessment component of the Water Quality Study. The Fishery Assessment would not involve any scientific sampling of fish populations. Instead, it would rely on existing information and interviews with various parties.

Although Great Lakes did not directly address the Department's request in its rationale for not adopting the Fish Assemblage Study, it did address a similar study request from a stakeholder group. Great Lakes appears to base its decision not to adopt the Fish Assemblage Study on its assertions that existing information is sufficient [section 5.9(b)(4)], that study results are not likely to inform potential license conditions [section 5.9(b)(5)], and that the study methods proposed by the stakeholder group (gill netting) are not consistent with generally accepted practice in the scientific community [section 5.9(b)(6)].

The Department disagrees with Great Lakes' assertions. First, existing information would not be sufficient to demonstrate that the Projects are currently meeting water quality standards. Historical and anecdotal data could be useful for fisheries managers, but it is unlikely to provide sufficient, defensible data for the Department to determine that the Projects' currently support all indigenous species of fish. Comprehensive, scientific sampling of fish populations would provide sufficient data to draw conclusions about the Projects' effects on water quality [section 5.9(b)(4)]. Second, the results of a Fish Assemblage Study would directly inform potential conditions that the Department could require in any Water Quality Certification it would issue for the project. Study results would be used to demonstrate attainment of

water quality standards related to fish populations in addition to providing evidence that the Projects meet water quality standards related to aquatic habitat more generally. If evidence of nonattainment is found, the Department will use the study results to inform the development of measures to mitigate for the Projects' effects on water quality. This is critically important to the relicensing proceeding, because FERC must include Water Quality Certification conditions in any new licenses for the Projects [section 5.9(b)(5)]. Third, the Department did not provide specific methods in its request since this type of study is commonly conducted in many FERC relicensing proceedings. Great Lakes' response focused on their concerns with the stakeholder group's proposed methods for collecting fish samples (gill netting). Great Lakes did not discuss any other generally accepted, and more commonly used, practices that the scientific community typically uses in fish assemblage studies, such as electrofishing. Due to this omission, Great Lakes' response did not fully address the study criteria, nor does it provide a basis for Great Lakes to not adopt the Department's requested study [section 5.9(b)(6)]. For these reasons, the Department requests that FERC determine that Great Lakes must complete a Fish Assemblage Study.

**GLHA Response**

To demonstrate that the Ripogenus Project meets applicable water quality standards, GLHA proposed in the RSP to complete additional data review and meet with regional Maine Department of Inland Fisheries and Wildlife (MDIFW) biologists who have current, first-hand knowledge of the existing Chesuncook Lake fishery to identify and describe indigenous species that are known to occur. In addition, GLHA proposed a macroinvertebrate study at the Ripogenus impoundment and aquatic habitat studies at the North Twin and Millinocket Lake impoundments to determine if aquatic life standards are supported in the Project areas. GLHA did not propose aquatic habitat assessments for the Millinocket (Quakish Lake and Ferguson Pond), Dolby, and East Millinocket impoundments because they are operated in run-of-river mode, which does not result in impoundment drawdowns under normal operations; MDEP typically does not require impoundment aquatic habitat studies for projects operated in run-of-river mode.

As described in the RSP, indigenous fish species known from the region include brook trout, yellow perch, white sucker, rainbow smelt, longnose sucker, lake whitefish, lake chub, golden shiner, fallfish, creek chub, common shiner, burbot, brown bullhead, and blacknose dace (Lakes of Maine 2022[2]). Most of these species are common throughout Maine waters. As described in Table 5-4.3 of the PAD, GLHA has previously documented that the Ripogenus impoundment supports these indigenous game and non-game fish species. The Licensee collected 18 species of fish in the Ripogenus impoundment as part of the last relicensing, including all known indigenous game and non-game fish species.

GLHA notes that the MDIFW, the principal state resource agency responsible for fisheries management and monitoring, did not request site-specific fisheries studies given the considerable

[2] Lakes of Maine. 2022. Database of Maine Lakes. Online [URL]: https://www.lakesofmaine.org/index.html?r=1650984792. Accessed April 14, 2022.

body of knowledge and their overall understanding of the fish assemblage in the Ripogenus Project area. MDIFW noted in its comments on the PAD (October 8, 2021) that there is an "*extensive history of inland fisheries studies associated with the Ripogenus Project completed in preparation for the 1996 license, and these studies need not be duplicated unless there are identified data gaps, or changes in operation that may impact the fisheries resources*." MDIFW also noted that the "*inland fisheries management goals for the Ripogenus impoundment and river have not changed since the last license was approved*."

In addition to the fisheries information collected during the previous relicensing effort, MDIFW has indicated that there is additional existing information on fishery resources in Chesuncook Lake of the Ripogenus impoundment that demonstrates the waterbody continues to support the indigenous fish species. GLHA spoke to the MDIFW Regional Biologist responsible for fisheries management at the Ripogenus Project on April 15, 2022, to discuss the fishery assemblage in Chesuncook Lake. During the call, MDIFW conveyed again that they have a good understanding of the Ripogenus impoundment fish community, and that there are more recent data (e.g., creel angler data and fish stomach content data) that can demonstrate the impoundment supports the indigenous fish assemblage. The following is a brief summary of the discussion with MDIFW during the April 15th conference call:

- MDIFW has a good understanding on species composition in Chesuncook Lake and is comfortable with the information that is available.
- No exotic species are known to occur.
- MDIFW offered to generate a species list from recent and past angler creel data (1,000s of hours of fishing records) that will document indigenous game and non-game species.
- MDIFW may have information from stomach content analysis that could supplement the species list.

On April 25, 2022, MDIFW provided additional data to GLHA consisting of raw data and a summary of data collected from the Ripogenus Impoundment between 1996 and 2021. The data summary provided by MDIFW is provided as an attachment to this letter.

Consistent with the approach that GLHA proposed in the RSP, GLHA will continue to work collaboratively with MDIFW staff to obtain and understand the existing fisheries data available for the Ripogenus impoundment. Additionally, GLHA will process and evaluate the raw data provided by MDIFW and provide a detailed summary of the data in the ISR to demonstrate the current make-up of the fish community.

GLHA's approach to compile and review existing contemporary data and work with MDIFW regional biologists to document that Chesuncook Lake continues to support the indigenous fishery assemblage, along with the proposed macroinvertebrate study in Chesuncook Lake and the aquatic habitat studies at the North Twin and Millinocket Lake impoundments, is a reasonable

and logical approach to determining if the structure and function of the waterbodies in the Project area are maintained.

Existing data from the previous licensing process, more contemporary data (e.g., MDIFW creel data), and professional input from MDIFW biologists will allow GLHA to document that the indigenous species assemblage in Chesuncook Lake is supported without the need for comprehensive, labor-intensive, and costly baseline fish assemblage studies throughout the Project area requested by TU and MDEP.

GLHA also notes that although electrofishing and other netting methods (e.g., seining, trap-netting) are common techniques for sampling shallow, near-shore habitats, it is unlikely that these methods (recommended by MDEP) will capture deep water or pelagic fish species (e.g., lake trout and lake whitefish), so they will only confirm the presence of common, near-shore fish species such as perch, minnows, and fallfish, which are already known to occur.

**April 7, 2022 Letter filed by Maine Council of Trout Unlimited (TU)**

**Comment on Stranding Evaluation Study**

TU submitted study requests for two types of studies: a Ripogenus Flow Excursion Study and a series of Fish Assemblage Studies correlating to the reaches described in the Pre-Application Document. In its Proposed Study Plan (PSP), Brookfield stated the Historical Operations Data and Assessment Study would document any such deviations from project minimums; however, the proposed study did not account for the stranding study component of our requested Flow Excursion Study. Accordingly, TU proposed a Stranding Evaluation Study in its PSP Comments.

**GLHA Response**

GLHA's rationale for not adopting the TU-requested Stranding Evaluation Study is consistent with that provided in the RSP in response to the Ramping Study requested by Mr. Ed Spear. GLHA believes that information collected and reported from other proposed studies, such as the Historical Operations Data Assessment Study, will provide information on how the Ripogenus Project has been operated, including flows provided by McKay Station. Additionally, fieldwork to be performed in the West Branch below McKay Station for other studies will provide additional information regarding flows in the West Branch in relation to aquatic resources.

Concurrent with this filing, GLHA is providing a copy of this letter to all parties listed in the attached distribution list, which can also be downloaded from FERC's eLibrary system at https://www.ferc.gov/docs-filing/elibrary.asp by conducting a search using the docket numbers p-2458 and/or p-2572.

If you have any questions regarding this letter, please contact me by phone at (207) 775-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman
Licensing Manager
Brookfield Renewable

Attachment: Summary of MDIFW Fish Data for Ripogenus Impoundment

cc: Distribution List

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

## Federal Agencies

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Stephanie Carman
Acting District Manager
Northeastern States
Bureau of Land Management
626 E. Wisconsin Avenue, Suite 200
Milwaukee, WI 53202-4617

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Kimberly Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Deborah Szaro
New England Region 1
Regional Administrator (Acting)
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Kenneth Hogan
North Atlantic-Appalachian Region Hydropower
Program Coordinator
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03301

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

## State Agencies

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Kyle Olcott
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
101 Second Street
Hallowell, ME 04347

## Municipalities and Government Officials

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Dr. Annette Padilla, PhD
Interim Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
4 Gabriel Drive, Suite 3
Augusta, ME 04330

Jeffery Gifford
State Representative
346 Frost Street
Lincoln Center, ME 04457

Peggy Jo Stanley
State Representative
413 Turnpike Road
Medway, ME 04460

## Native American Tribes

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Marla Dana
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

## Additional Parties

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Stephen Perry
Representative
Carpenters Health and Safety Fund

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

Kelly Maloney
Manager
Great Lakes Hydro America LLC
150 Main Street
Lewiston, ME 04240

John Dicentes
President
International Association of Machinists
64 Congress Street
Millinocket, ME 04462-1312

Robert Farrington
International Brotherhood of Fireman
HCR 86, Box 195
Medway, ME 04460

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Director
Maine Professional River Outfitters
PO Box 669
Millinocket, ME 04462-0669

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Bill Houston
Board of Directors
National Wildlife Federation

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Allison Economy
Representative for Allagash Gateway Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Thomas Nannery
Sportsman's Alliance of Maine
RR 1 Box 1174
Augusta, ME 04330-9801

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

Jeffrey Reardon
Maine Brook Trout Project Director
Trout Unlimited
267 Scribner Hill Road
Manchester, ME 04351

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Jeff Fayle

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris

Kathy Houston
58 Mystery Road
Kingfield, ME 04947

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Charles Paone

Richard Parkes

Ed Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Robert Van Deventer

Wes Zemrak
2 Brookside Drive
Falmouth, ME 04105

# Summary of MDIFW Species Data from Chesuncook Lake 1996 to 2021

**IFW Clerk Surveys (completed by our staff)**

Winter: We conducted winter clerks surveys in 8 years during the period 1996 – 2021

Summer: We conducted summer clerk surveys in 4 years during the period 1996- 2021

Data summary all years/all seasons:

Total Angler days: 1,821

Total Angler Hours: 10,444

| Species | # Reported (all sizes) |
|---|---|
| Brook Trout | 25 |
| Cusk | 222 |
| Fallfish | 70 |
| Lake Trout | 13 |
| Landlocked Salmon | 2087 |
| Lake Whitefish | 7 |
| Smelt | 390 |
| Splake | 20 |
| White Perch | 300 |
| Yellow Perch | 355 |

# Summary of MDIFW Species Data from Chesuncook Lake 1996 to 2021

**Voluntary record book data**

Winter: We have data from 24 years during the period 1996 – 2021

Summer: We have data from 23 years during the period 1996- 2020

Data summary all years/all seasons:

Total Angler days: 2,777

Total Angler Hours: 15,523

| Species | # Reported (all sizes) |
|---|---|
| Brook Trout | 28 |
| Cusk | 87 |
| Fallfish | 64 |
| Lake Trout | 22 |
| Landlocked Salmon | 6,318 |
| Smelt | 7 |
| Splake | 32 |
| White Perch | 3,474 |
| Yellow Perch | 171 |

MDIFW Age and growth data – These are fish that our staff have handled during creel surveys. They are typically measured, weighed, scale samples and a subsample of stomachs taken.

| Species | # Examined | Mean Length ( mm) | Ages represented |
|---|---|---|---|
| Brook Trout | 4 | 352 | 2-4, 6 |
| Cusk | 17 | 501 | |
| Lake Trout | 7 | 711 | 8,10,17 |
| Landlocked Salmon | 428 | 405 | 3-8 |
| Splake | 19 | 415 | 3-6 |

**Summary of MDIFW Species Data from Chesuncook Lake**
**1996 to 2021**

Food Habits data – Stomach samples are taken during winter clerk surveys. Food items are identified, enumerated, and volumes measured by displacement.

| Species with Stomachs Examined | # examined |
|---|---|
| Brook Trout | 4 |
| Lake Trout | 16 |
| Landlocked Salmon | 376 |
| Splake | 7 |

Food items identified in stomachs

Smelt

Unid. Fish Remains

White Perch

Old Hooks

Insects

White Suckers

Frogs

Unid. Minnow spp

Rocks

Vegetation

# Summary of MDIFW Species Data from Chesuncook Lake 1996 to 2021

**Notes**:

Brook Trout – Population is limited by competition by warm waters species such as white perch, yellow perch, fallfish, and suckers. Brook trout are present in the lake but not abundant. Likely abundant in the tribs.

Cusk: Abundant

Fallfish: Abundant

Lake Trout: Fishery was maintained through a stocking program. Stocking was terminated in 1994.

Landlocked Salmon: Abundant

Lake Whitefish: We are not clear on the status. They do not show up in the winter clerk surveys. If they were abundant, we would expect to see them. Anglers have reported them, but they may be misidentified round whitefish or, most likely, fallfish. The last lake whitefish IFW sampled were in 1970 during a gillnetting operation. Seventeen were taken that ranged in size from 415-520 mm.

Smelt: Present. Although not as abundant as in past years, the population is still considered stable. Anglers that target smelt are successful and smelt are commonly found in salmonid stomachs.

Splake: Splake occasionally drop downstream from Ragged Lake and Deer Pd into the Chesuncook System. Considered incidental.

White Perch: Abundant

Yellow Perch: Abundant

White Sucker: Abundant

# Attachment F

FEDERAL ENERGY REGULATORY COMMISSION
Washington, D. C. 20426

OFFICE OF ENERGY PROJECTS

Project No. 2572-119—Maine
Ripogenus Hydroelectric Project
Great Lakes Hydro America, LLC

**September 13, 2011**

Mr. Kevin Bernier
Brookfield Renewable Power Inc.
Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, Maine 04462

Subject: Article 401- Minimum Flow Deviation

Dear Mr. Bernier:

Thank you for your letter filed on July 15, 2011, notifying the Commission of a temporary modification in the minimum flow requirement, which is required under Article 401 of the license for the Ripogenus Hydroelectric Project, FERC No. 2572.[1]

Article 401

Article 401 requires you to maintain a minimum flow of 100 cubic feet per second (cfs) from the Ripogenus Dam into the Upper Gorge of the West Branch of the Penobscot River from July 1 until September 30.

Summary of Events

By letter dated July 15, 2011, you notified the Commission that a deviation in the minimum flow requirement from the Ripogenus Dam occurred from July 1 to July 5, 2011. Specifically, you stated that on July 5, 2011, you discovered that the Upper Gorge flow of 100 cfs had not been started on July 1, as required by Article 401. Immediately upon discovering this error, technicians were dispatched to the Ripogenus Dam and the minimum flow of 100 cfs was established at 3:50 P.M on July 5. In your July 15, 2011 letter, you state that the reason that the minimum flow had not started on July 1 was a result of the Penobscot Resource Manager's failure to enter the date in his Microsoft Outlook Calendar in order to provide adequate notification for the flow change.

[1] *Great Northern Paper, Inc.*, 77 FERC ¶ 61,066 (1996).

This event has subsequently been added to the Penobscot Resource Manager's Outlook calendar, and all other license flow requirements have been verified as being present in the calendar. In addition, you recently implemented a new management system, part of which will allow you to better manage maintenance tracking and planning. All license flow changes are now in the management system and will act as another layer of assurance that the flow changes will be made on time. Furthermore, the Penobscot Water Resource Manager will review license requirements on a weekly basis to ensure that all required changes are identified quickly and planned for accordingly.

Conclusion

Based upon review of the available information, we have determined that the temporary deviation of the minimum flow at the Ripogenus Project from July 1 to July 5, 2011, was due to a failure in tracking the flow changes as required by the license, and therefore was the result of operator error. However, once you determined the cause of the interruption, you promptly rectified the problem, and have subsequently implemented corrective measures to ensure that the seasonal flow changes will occur on schedule. Therefore, we have determined that the temporary deviation was a violation of your license, and we will include the incident in the compliance history for the Ripogenus Project, but without recommending any penalties at this time. However, we remind you that failure to implement seasonal flow requirements for the Ripogenus Project may result in penalties in the future.

Thank you for your cooperation in this matter. If you have any questions regarding this letter, please contact Kelly Houff at (202) 502-6393, or by email at Kelly.Houff@ferc.gov.

Sincerely,

William Guey-Lee
Chief, Engineering Resources Branch
Division of Hydropower Administration
and Compliance

Brookfield

Brookfield Renewable Energy Group
New England Regional Operations Center
Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, Maine 04462

Tel 207.723.4341
Fax 207.723.3948
www.brookfieldrenewable.com

**Attachment G**

June 23, 2015

**FERC Project No. 2572**
**Article 402**

Secretary Kimberly S. Bose
Federal Energy Regulatory Commission
Mail Code: DLC, HL-11.2
888 First Street, N.E.
Washington, D.C. 20426

Dear Secretary Bose:

**RE: Ripogenus Project 2572; Article 402 Compliance; Flow Excursion due to McKay Station Outage**

Great Lakes Hydro America, LLC (GLHA), licensee for FERC Project No. 2572-ME (Ripogenus) in Maine, is filing this letter to report an approximately one-hour reduction in outflow from the Project's McKay Station to the West Branch of the Penobscot River on June 13, 2015. As described below, after discovery of the excursion, GLHA promptly remedied the triggering transmission line pole cross arm failure, and opened a gate temporarily to ensure that the outage flow will continue to be met should another excursion occur. Further remedial measures to prevent recurrence are also being explored, as described below.

## Background

Article 402 of the Project license requires certain minimum flows, including a minimum flow of 400 cfs during unit outages at the Project's McKay Station. Specifically, the Article 402 outage flow requirement states:

> *"Outage flows (during failure of generating units at McKay Station) of 400 cfs, with scheduled minimum flows to be resumed as quickly and practically as possible by releases from Ripogenus dam if necessary, but in no event in more than three days following the initial outage".*

Article 402 further states that minimum flows at the Project may be temporarily modified if required by operating emergencies beyond the control of the licensee, with subsequent notification to FERC within 10 days of the flow modification.

## Description of the Excursion

On Saturday evening, June 13, 2015, at 18:27 hours, a pole cross arm on the Ripogenus transmission line failed and hit the ground, which started a small fire that GLHA promptly extinguished. The line failure tripped McKay Station to cease operating, thereby reducing its outflow to the West Branch of the Penobscot River to approximately 100 cfs. McKay Station has a minimum flow system designed to ensure continued outflow of 400 cfs during a station outage, but that system malfunctioned and activated only one of the three units. As a result, the minimum flow dropped below the required minimum 400 cfs outage flow level for 63 minutes.

Brookfield

Brookfield Renewable Energy Group
New England Regional Operations Center
Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, Maine 04462

Tel 207.723.4341
Fax 207.723.3948
www.brookfieldrenewable.com

GLHA promptly responded by opening crest gate #1 at Ripogenus Dam, which increased the river flow to approximately 1,320 cfs, thereby resuming the scheduled minimum flow. At 20:05, GLHA opened crest gate #2 at the Dam, thereby returning total river flow to about 2,550 cfs. McKay Station remained down until transmission line repairs were completed and the line was re-energized at approximately 13:00 hours on June 16, 2015.

**Steps Taken to Prevent Reoccurrence**

As noted, as a first step toward preventing recurrence, GLHA repaired the transmission line. In the short-term, GLHA has opened a gate at Ripogenus Dam to ensure that the outage flow is met in the event of another station trip. GLHA will keep this gate open until GLHA is confident that the minimum flow system will function properly and provide the required 400 cfs flow during any subsequent station outages. In addition, GLHA initiated a detailed internal investigation, which is still ongoing, and has been troubleshooting the cause for the minimum flow system malfunction. After the cause(s) of the transmission line failure and system malfunction is/are fully identified and rectified, GLHA will update the Commission with any additional corrective measures that result.

**Conclusion**

The excursion detailed in this report was the result of both an unscheduled interruption in generation at McKay Station (due to a transmission line failure) and a malfunction of the station's minimum flow system (which is intended to provide a 400 cfs outage flow during outages). GLHA promptly implemented the appropriate measures to respond to the interruption in a timely manner, thus minimizing the duration of the excursion.

GLHA is not aware of any adverse impacts to fish or wildlife resources or water quality in the Penobscot River as the result of this flow disruption, and no additional incidents (safety, dam safety, public safety, security) resulted from this event.

Please feel free to contact me at (207-723-4341, x118) if you have any questions or comments.

Sincerely,

Kevin Bernier

Kevin Bernier
Senior Compliance Specialist

cc: A. Zarrella, R. Dewechter, J. Seyfried, K. Murphy, M. Osborne, T. Mapletoft, J. Cole, M. Craig, M. Stanley, J. Clere, T. Wynn, B. Stetson; GLHA
K. Howatt; MDEP
S. Shepard, A. Bentivoglio; F&WS
D. Kane, J. Perry, T. Obrey; MDIFW

EMS File: 13C

# Attachment H

February 10, 2022

Ms. Kimberly D. Bose
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Via online submission to: http://www/ferc.gov (cross-filed)**

Subject: **Preliminary Comments on the Proposed Study Plan (PSP) for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458)**

Dear Secretary Bose:

The Maine Council of Trout Unlimited ("TU"), Appalachian Mountain Club ("AMC"), American Whitewater ("AW"), Caribou, Chesuncook Lake Camp Owners Association, Chesuncook Dam Camp Owners Association, the Allagash Gateway Campground, and Andre Emerson Cushing Corporation file these comments to address our underlying concerns regarding the current status and direction of the relicensings of the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) being undertaken by Great Lakes Hydro America, LLC for Brookfield Renewable ("Brookfield") or ("Applicant"). Brookfield filed its Proposed Study Plan on November 22, 2021. While each of our organizations intends to file separate comments in response to specific study requests, we are providing these comments to voice our shared concerns regarding the manner in which Brookfield has approached the relicensing process to date.

**Background**

Maine Council of Trout Unlimited represents six local chapters with over 2,000 fisher-conservationists in Maine. The mission of the organization is to bring together diverse interests to care for and recover rivers and streams so our children can experience the joy of wild and native trout and salmon. The entire watershed of the West Branch of the Penobscot is especially important to a great many of our members who enjoy its fishing resources, including the area from McKay Station to Nesowadnehunk Falls, Ripogenus-Chesuncook-Caribou Lake, and the waters below to its confluence with the main stem of the Penobscot River that are greatly affected by the Ripogenus and Penobscot Mills projects.

Since 1876, the Appalachian Mountain Club has promoted the protection, enjoyment, and understanding of the mountains, forests, waters, and trails of the Appalachian region. AMC is the largest conservation and recreation organization in the Northeast with more than 90,000 members, supporters, and advocates, many of whom visit the lands and waters upstream and downstream of the projects for recreation.

American Whitewater is a national non-profit 501(c)(3) river conservation and recreation organization founded in 1954. With approximately 6,000 members and 100 affiliate clubs, representing tens of thousands of whitewater paddlers across the nation, American Whitewater's mission is to protect and restore our nation's whitewater resources and to enhance opportunities to enjoy them safely. Our members are primarily conservation-oriented kayakers and canoeists, many of whom live and/or engage in recreational boating in the New England region within reasonable proximity to the West Branch of the

Penobscot River. American Whitewater has long been involved with the FERC licensed hydropower projects in Maine, including hydropower projects located on the Penobscot, Kennebec, Rapid, and Magalloway rivers, and is party to settlement agreements that provide for whitewater boating opportunities that partially mitigate for project impacts. We highly value the whitewater activities offered by the West Branch.

The Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association represent the interests of those with property on the shores of these lakes who have been greatly affected by the severe dewatering of the Ripogenus-Chesuncook impoundment in recent years.

Allagash Gateway is a four-season sporting camp located on Ripogenus Lake near the Chesuncook Dam Point Boat Launch. It offers a private boat launch, canoeing, campsites, lodging, guide services, and a small store. During the summer months, Allagash Gateway's clientele is primarily interested in boating and fishing the lakes that make up the Ripogenus impoundment. Operations of the campground have been profoundly impacted over the last few years by the water levels of Ripogenus Lake and Chesuncook Lake.

Andre Emerson Cushing Corporation is the majority landowner in T3 R12 WELS. Approximately 80% of Ripogenus Lake and 20% of Chesuncook Lake are within the boundaries of T3 R12 WELS. William Cushing, a director of Andre Emerson Cushing Corporation, is a year-round resident of T3 R12 WELS, and his home is on Ripogenus Lake.

**The Problem**

Brookfield devotes pages of the Pre-application Document (PAD) to the assertion that: "*GLHA maintains that a full suite of new studies is not needed, that the vast body of information on which today's certifications and licenses are soundly based and should be relied upon for these relicensings. In addition, consistent with the Commission's criteria for study requests, the scope and extent of any new study be focused on addressing specific data gaps necessary to inform the development of license requirements."*[1] The PAD goes on to explain: "*These PM&E measures comprehensively address resource interests specific to the Project areas, as well as the larger river basin. These interests include water quality; management and balancing of flows within and downstream of the West Branch; aquatic and terrestrial resources; whitewater and recreational opportunities; cultural resources; and land management*."[2] The implication is that these measures remain fully adequate when they are not. The PSP states: "*Based on the totality of studies conducted, settlement agreements reached, PM&E measures incorporated, and water quality certifications issued, FERC's 1996 licenses concluded that the Projects are best adapted to serve the public interest. GLHA maintains that nothing has significantly changed that would alter this conclusion."*[3]

These assertions could not be more wrong and started the relicensing off on the wrong foot. A glaring example: The Ripogenus-Chesuncook impoundment has not been fully watered in two years, and the boat launch provided as PM&E has been so far from the waterline for most of the summers so as to be practically unusable, as many photos have clearly shown. The public interest has vastly changed since the last relicensing. Agencies bent over backward to ensure the profitability of the mills in East

[1] Brookfield Notices of Intent and Pre-application Documents for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) dated June 11, 2021, page 1-11.

[2] Id., page 1-8.

[3] PSP, pages 11-12.

Millinocket, the major employer in the area, that were supplied by power the projects provided. If that were not the case, the Use Attainability Analysis (UAA) and the provisions of 38 M.R.S.A. § 464(9-A) would not have allowed so much leeway for project operations, e.g., no minimum drawdown for the Ripogenus-Chesuncook impoundment other than the lowest levels the physical characteristics of Ripogenus Dam allow. Other examples included the dewatered Ripogenus Gorge on the main stem of the West Branch below Ripogenus Dam and 4.5 miles of the main stem below Stone Dam. **It is highly unlikely that these examples would have been permitted under the last relicensings were it not for economic considerations that simply no longer exist.** With the mills closed and the electricity produced by the projects going to the grid and not dramatically affecting the economy of the region, the situation has changed greatly, and that change needs to be acknowledged for the relicensing process to proceed effectively under the ILP. Brookfield should acknowledge this fact or include the request for a socio-economics study submitted by the Penobscot Indian Nation[4] in its Revised Study Plan.

Brookfield is required to provide FERC with information in the PAD and PSP referencing either relevant and recent existing studies or proposing new studies that address a number of subject areas including: Fish and Aquatic Resources, Recreation and Land Use, Aesthetic Resources and Tribal Resources. Instead, Brookfield relies on dated, unavailable, or non-existent studies or directs stakeholders to search for the information themselves at other agencies or on the Internet. Examples: Fisheries Resources - including "*Species life stage composition*"[5] were provided by referencing data some of which is over 30 years old. During the PSP teleconference, Brookfield referred the requirement to the Maine Department of Inland Fisheries and Wildlife. It is not the Department's requirement to provide the information, it is the Applicant's obligation, and the data still has not been fully provided for all projects' reaches except by references to a number of studies of varying ages. Recreation and Land use was nearly ignored, and we fail to understand the relevance of Brookfield's reference to "*Existing shoreline management policies*"[6] for an impoundment that has not been fully watered for two years and where the waterline has generally been hundreds of feet from the boat launch it accesses. There are many recreational amenities not in the project area that are well known and frequently used that will not be considered by forthcoming studies. The accepted information and study standards are simply being ignored.

The key studies are the flow studies proposed by the National Marine Fisheries Service (NMFS); key information is the ten years of operational data requested by the National Marine Fisheries Service (NMFS) There is no USGS flow gauge above the Medway Project nearby to the confluence of the West Branch with the main stem of the Penobscot River. Brookfield has been reluctant to release operational data that would reveal flows. Brookfield clearly has this data and has provided it to FERC Compliance Division on a number of occasions when reporting flow excursions. There was some discussion during the PSP Teleconference of delaying the requirement for a project operations and flow monitoring plan until after the new license is issued. This would make the relicensing process itself nearly meaningless. Over 50 years have passed since the passage of the Clean Water Act. Our nation's waters now run clean but too many still lack the indigenous aquatic organisms due to dams and lack of access to critical habitat. The dams on the West Branch will remain for the foreseeable future. The task of relicensing is to manage the resource most effectively to support all uses including power generation, ecology, recreation and aesthetics. Flow data is essential to the relicensings of both projects. It has been available all along and should have been offered with the PAD. While Brookfield has stated that it will provide

[4] Penobscot Nation letter dated October 12, 2021, RE: Penobscot Mills (P-2458-247) and Ripogenus (P- 2572-133) Notice of Intent, Pre-application document, Scoping document #1 and study requests

[5] Id., page 5.

[6] Id., page 6.

some flow data with the RSP, this will not provide stakeholders with sufficient time to analyze and comment on data that Brookfield has yet to provide.

The Integrated Licensing Process is intended to "s*treamline the Commission's licensing process by providing a predictable, efficient, and timely licensing process that continues to ensure adequate resource protections.*" To date, any reasonable analysis of Brookfield's participation in the Ripogenus - Penobscot Mills relicensing process indicates that Brookfield is attempting to delay and confuse the process by failing to provide the data required by FERC with the PAD, and then rejecting study requests involving the data.

**The Commission's Opportunities**

The FERC process has developed over the years to provide an orderly process leading toward licensing or relicensing of an energy project. 18 CFR § 5.6 clearly defines what information the applicant should provide in the PAD. Instead of providing it, Brookfield referenced studies conducted over 30 years ago and proposed to fill "data" gaps. Stakeholders submitted requests for the information in their PAD comments; Brookfield's response was to concentrate on the study requests and instead of providing the requested information in a usable form, to provide or reference old studies. This is not how relicensings are generally conducted under the ILP, whether or not the relicensing is the first conducted after passage of Electronic Consumers Protection Act (ECPA).

We appreciate FERC staff's recognition that the terms "dry way" and "back channel," used by Brookfield to refer to dewatered sections of the main stem of the West Branch, are inappropriate. We also applaud SD2 as a significant step in the right direction and expanding significantly on the limited scope that Brookfield had proposed. Brookfield's response was to issue a Proposed Study Plan that only accepted three studies as submitted. In a number of cases, studies are rejected that are clearly indicated by the SD2 as within the scope of FERC's planned NEPA analysis, yet Brookfield is not committing to completing studies that will address the data gaps and scope provided by SD2. For example, SD2 identifies that the NEPA analysis will seek to understand the effects of the projects on angling access/opportunities on the project impoundments, yet the PSP provides for no methodology or approach within the recreation study to specifically survey or assess the impact to and quality of angling on the impoundments and this information cannot be ascertained solely through spot counts and a facility assessment. Comparable, SD2 indicates that the NEPA analysis will assess the effects of the projects on angling opportunities for landlocked salmon and brook trout in the riverine reaches, which cannot be adequately assessed using the PSP's methodology which includes only site assessments and spot counts.

Furthermore, in arguing that study requests lack a nexus to project effect, the licensee relies on the *Centralia* decision (*City of Centralia v FERC*, 213 F.3d 742, 749 (D.C. Cir., 2000)) to argue that certain studies are an attempt to search for a problem where there is no evidence that problem exists. The licensee's reliance on *Centralia* is misplaced. That case concerned a post-license study of the need for a tailrace barrier net where there was substantial evidence in the record that the barrier net was unneeded. There the court found that the project effects of the discharge on fish were entirely speculative. Similarly, in *City of Jackson, Ohio*, 105 F.E.R.C. ¶61,136 n.9 (2003), a FERC decision on which the licensee relies, likewise involved a post-license study to assess whether the project was having an adverse effect on fisheries resources. This decision is inapplicable to circumstances such as are present on the West Branch of the Penobscot where the effect of the project on a protected resource is clear and the study is designed to evaluate the extent of that impact so that FERC can complete its NEPA review based on its scoping document. *FPL Energy Maine Hydro, LLC*, 95 F.E.R.C. ¶61,106 n.15 (2001)

and *Allegheny Energy Supply Company, LLC*, 109 F.E.R.C. ¶61,028, 61,117 (2004), also cited by the licensee, likewise involved the need for a license condition requiring a post-license study of project effects on fish. Each of these cases is inapposite to the study requests on the West Branch.

The licensee endeavors to extend the holding in *Centralia* and subsequent FERC decisions to argue against requiring studies *during* the pre-application phase of the Integrated Licensing Process (ILP) to limit the information available to FERC for its NEPA analysis. FERC's nexus requirement in its study criteria was not intended to create a barrier to study of project effects on resources that are within FERC's power to address in a license condition. In effect, the licensee's circular logic would require prior study in order to justify the need for a study while prior study makes the need for a study unnecessary. To meet FERC's nexus criteria, a proposed study need only show that the project has a direct or indirect effect on a non-developmental resource that will be evaluated by FERC as part of its environmental assessment. This Catch-22 scenario was certainly not what Congress intended when the Electric Consumers Protection Act amended the Federal Power Act to require that FERC "shall give equal consideration to the purposes of energy conservation, the protection, mitigation of damage to, and enhancement of, fish and wildlife (including related spawning grounds and habitat), the protection of recreational opportunities, and the preservation of other aspects of environmental quality." 16 U.S.C. § 797(e).

The circumstances surrounding the *Centralia* decision are different from those surrounding the Ripogenus - Penobscot Mills relicensings. Brookfield has applied the phrase "*where evidence of a problem has not been shown"* to a number of study requests. The dewatering large areas of Maine's third largest lake for months at a time, dewatering its most dramatic gorge or a 4.5 mile section further downstream, or abruptly reducing flows from about 2000 cfs to 400 cfs or lower stranding fish and macro-organisms in the process, provides ample evidence that a problem exists.

**Conclusion and Requests**

Accordingly, we ask that:

- FERC require that Brookfield address these comments when evaluating each stakeholders' individual Proposed Study Plan Comments, and offer a Revised Study Plan that will inform the process with current information.
- FERC review the applicant's revised study plan immediately after issuance to ensure that all scope items included in SD2 will be adequately assessed in the proposed studies and that the revised study plan include methodologies that will close all data gaps. Should any gaps continue to exist between the scope of the NEPA analysis and the studies proposed by the applicant, FERC should require the applicant to update the revised study plan, before stakeholders are required to comment on the revised study plan.
- FERC staff consider these comments in making its Study Plan Determination and insist on a suite of studies that will inform the process in accordance with FERC guidelines pursuant to 18 CFR § 5.6 and avoid larger problems later in the relicensing process.
- FERC staff extend the deadline for comments on the Revised Study Plan to 60 days to allow the public to provide additional comments based on operations data and other information provided in the RSP that was not provided with the PSP.

Our organizations appreciate the opportunity to provide these preliminary comments on these important projects and hope that the Commission will act to allow the resource protection agencies to obtain a range of studies that can identify potential harms to the resource and thus enable the Commission to balance project harms and benefits.

Respectfully submitted,

Matthew Streeter
Maine Council Chair
Trout Unlimited

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club

Bob Nasdor
Northeast Stewardship & Legal Director
American Whitewater

Bill Houston
Designated Representative
Chesuncook Lake Camp Owners Association, Chesuncook Dam Camp Owners Association

Allison Economy, Esq., Rudman Winchell Law Firm
Legal Representative for
Allagash Gateway Campground and
Andre Emerson Cushing Corporation

Mailed copies to:

Connor Teskey CEO
Brookfield Renewable Partners L.P.
Brookfield Place, Suite 300
181 Bay Street
Toronto, ON M5J 2T3

Merimil Limited Partnership
Corporation Service Company
45 Memorial Circle
Augusta, ME 04330

F. Mitchell Davidson, CEO
Brookfield Renewable - US
Brookfield Power US Holding America Co.
200 Liberty Street, 14th Floor
New York, NY 10281

Brookfield Power US Asset Management LLC
Brookfield White Pine Hydro, LLC
200 Donald Lynch Bvld, Suite 300
Marlborough, MA 01752

Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462

Randall Dorman
Licensing Manager, Brookfield Renewable
150 Main Street
Lewiston ME 04240

**Attachment I**

# Historical Operations Data Assessment Study Plan

## 1.0 Study Requests

Although there were no formal study requests related to an assessment of historical operations data for the Projects, numerous stakeholders submitted comments requesting that GLHA provide detailed historical operations data. Due to the substantial amount of time needed to develop detailed historical operations data for six developments relative to the larger relicensing schedule, GLHA is proposing to address the stakeholders' information requests through a Historical Operations Data Assessment Study.

## 2.0 Goals and Objectives

The goals and objectives of the proposed study are to compile relevant historic operations data for both Projects to allow stakeholders to better understand historical operations of the Projects and associated water management objectives in support of the relicensing of the Projects.

## 3.0 Resource Management Goals

The West Branch of the Penobscot River in the vicinity of the Projects is managed by the Maine Department of Inland Fisheries & Wildlife (MDIFW) as a combination of warmwater, coolwater, and coldwater fisheries, with a focus on landlocked salmon and brook trout. In addition, the Projects' impoundments and the West Branch between McKay Station and Ambajejus Lake (North Twin impoundment) provide significant recreational resources.

## 4.0 Study Area

The study area consists of each development associated with the Ripogenus and Penobscot Mills Projects.

## 5.0 Background and Existing Information

The Ripogenus and Penobscot Mills Project developments were originally constructed between the late-19th century and mid-20th century to meet the hydromechanical and hydroelectric demands of the Millinocket and East Millinocket Mills, which were constructed in 1900 and 1906, respectively.

The Federal Energy Regulatory Commission (FERC or Commission) issued original licenses for the Ripogenus Project on December 20, 1968, and for the Penobscot Mills Project on October 14, 1968, both of which expired on December 31, 1993. On June 28, 1991, the Commission issued an order amending the licenses to reflect a change in the Licensee's name from Great Northern Paper Company to Great Northern Nekoosa Corporation. On May 8, 1992, the Commission issued an order transferring the licenses from Great Northern Nekoosa Corporation to Great Northern Paper, Inc. The Projects each operated under annual licenses until the new licenses were issued to Great Northern Paper, Inc. on October 22, 1996. On May 19, 2000, the Commission issued an order transferring the licenses from Great Northern Paper, Inc. to GNE, LLC, and on August 26, 2002, FERC issued an order amending the licenses to reflect a change in the Licensee's name from GNE, LLC to Great Lakes Hydro America, LLC (the current Licensee).

The Projects were initially developed to power the paper mills located in Millinocket and East Millinocket. In 2008, the Millinocket paper mill was shuttered and in 2013 the East Millinocket paper mill was shuttered. After the mills were closed, GLHA converted the units from 40 Hertz (used to power the paper mills) to 60 Hertz (used to supply power to the grid), which occurred gradually over time since 2008 due to the significant capital investment associated with the conversion.

## 6.0 Project Nexus

Operation of the Projects influences impoundment elevations for each of the Project developments, as well as downstream riverine flows within and downstream of the Projects.

## 7.0 Methodology

GLHA proposes the following methods for this study:

- GLHA will identify the available, relevant, and accurate operational data for the Projects dating back no further than January 1, 1997, which is less than 3 months after issuance of the Projects' current licenses (October 22, 1996).
- GLHA will process the identified operational data to create graphics as it relates to impoundment elevations and downstream flows.
- GLHA will present the operations data in relation to the applicable license requirements for the Projects.

GLHA believes that the information presented in this study will allow FERC and stakeholders to better understand how the Projects have been operated during the term of the existing licenses in relation to license requirements and other aspects such as changes in operation or use of power. The information produced by this study will also help inform other studies and evaluation of potential impacts from Project operations and associated mitigation strategies, as appropriate.

## 8.0 Schedule

GLHA proposes to perform this study in 2022, with study results provided in the Initial Study Report to be filed with FERC by April 22, 2023.

## 9.0 Level of Effort

The estimated cost for this study as proposed is approximately $60,000.

## 10.0 Deviations from Requested Study

GLHA believes that the proposed study satisfies the requests for operational data by numerous stakeholders.

# Attachment J

Kimberly D. Bose May 9, 2022
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426 Via Electronic Filing

Re: The Ripogenus Projects P-2572

Great Lakes Hydro America's April 29, 2022 Filing, Articles 402 and 406: Violations not Excursions?

The Licensee's April 29, 2022 filing calls the past winter's low flow event an "excursion" when it was, in fact, a violation of two License Articles; 402 and 406. Extreme low fall and winter flows impacted two salmon year class (fry from 2020 and eggs from 2021 spawning) and aquatic communities. The impact of lost salmon reproduction will be evident in two to four years.

The licensee's April 29, 2022 "after the fact" *salmon spawning and incubation minimum flow excursion* Article 402 notification is not only six months late but additionally, fails to acknowledge the obvious violation of Article 406 of the Ripogenus Project License. Low McKay Station flow events that began September 6, of 2021 (GHHA filing of March 23, 2022) and continued into April, 18 2022. This impacted juvenile landlocked salmon (salmon) habitat in all areas downstream of McKay Station. Article 406 was designed as mitigation. The goal was to produce young-of-the-year salmon in the Holbrook spawning and nursey bypass channel. Article 406 requires a flow of 35 cfs for the period beginning June 1, continuing until October 15. At that time flows are increased to 65 cfs. On September 17, 2021 the licensee photographed the upper section of the Holbrook bypass area. These pictures clearly show a reach with low flow and unsuited to meet goals developed by MeDIFW. This was the first documented violation of Article 406. Flows were further reduced March 4, 2022 (March 9, 2022 filing). The result was the additional loss of salmon fry and parr overwintering in the bypass and downstream reaches. This was in addition to spawning and incubation losses admitted to by the Licensee in its April 29, 2002 filing. In summary, poor flow management resulted in a serious and avoidable violation of Article 406 and the loss of two years classes of salmon; winter kill of fry spawned in 2020 and spawning failure in the fall of 2021

FERC's licensing and compliance process is based on trust. Licensees are required to follow conditions imposed to mitigate private use of a public resource. In this framework the licensee is mandated to self-report any failure, for whatever reason, to comply with the term of its license. As several filings by interested parties in the on-going relicensing have shown, Brookfield does not understand the rules, or worse is willfully ignoring them.

The Licensee wants the public and FERC staff to believe that it had no idea it was required to provide water to the Holbrook by-pass. They simply maintained a pattern of providing water and when it dried up the fish eggs and other habitat for six months it was an excursion from that pattern. A violation for which they show no remorse.

In my opinion, FERC must impose a civil penalty of at least modest proportion, to demonstrate to this licensee that compliance and trust must be introduced to its corporate hydroelectric operations.

Thank you for the opportunity to comment.

Ed Spear

307 Mt Hope Ave
Bangor, Me 04402
Email edspear1@yahoo.com
Phone: 207-217-4288

CC Ms. Alicia Burtner

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, DC 20426
May 13, 2022

OFFICE OF ENERGY PROJECTS

Project Nos. 2572-133 & 2458-247 –
Maine
Ripogenus Hydroelectric Project
Penobscot Mills Hydroelectric Project
Great Lakes Hydro America, LLC

VIA FERC SERVICE

Randall Dorman, Licensing Manager
Brookfield Renewable
150 Main Street
Lewiston, Maine 04240

**Reference: Study Plan Determination for the Ripogenus Hydroelectric Project and the Penobscot Mills Hydroelectric Project**

Dear Mr. Dorman:

Pursuant to 18 C.F.R. § 5.13(c) of the Commission's regulations, this letter contains the study plan determination for the Ripogenus and Penobscot Mills Hydroelectric Projects (collectively, the "Projects"). The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot Counties, Maine. The determination is based on the study criteria set forth in section 5.9(b) of the Commission's regulations, applicable law, Commission policy and practice, and the record of information.

Background

On November 22, 2021, Great Lakes Hydro America, LLC (GLHA) filed a proposed study plan (PSP) for 12 studies[1] related to water quality, fisheries, recreation, and cultural resources in support of its intent to relicense the Projects.

[1] The PSP lists eight proposed studies. The proposed Water Quality Study includes five component studies/assessments, which we consider separately. Thus, for our purposes, the PSP consists of a total of 12 studies.

GLHA held study plan meetings on December 15 and 16, 2021, to discuss the PSP. Comments on the PSP were filed by the National Marine Fisheries Service (NMFS); the U.S. Fish and Wildlife Service (FWS); the Penobscot Indian Nation; the Maine Department of Environmental Protection (Maine DEP); the Maine Department of Inland Fisheries and Wildlife (Maine DIFW); the Maine Department of Marine Resources (Maine DMR); the Maine Department of Agriculture, Conservation & Forestry - Bureau of Parks and Lands (Maine BPL); the Maine Historic Preservation Commission; American Rivers and Appalachian Mountain Club (collectively, AW/AMC); the Maine Council of Trout Unlimited (Maine TU); the Atlantic Salmon Federation; the Caribou and Chesuncook Lake Camp Owners Association; Edward Spear; and eleven additional members of the public.

GLHA filed a revised study plan (RSP) on March 23, 2022, which included the 12 studies filed in the PSP, and 8 additional studies related to project operations, water quality, aquatic and terrestrial resources, recreation, and aesthetics, for a total of 20 proposed studies. Comments on the RSP were filed by FWS, NMFS, Maine DIFW, Maine DEP, Maine BPL, Maine TU, AW/AMC, Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Associations (collectively, the Camp Owners Associations), the Maine Professional Rafting Outfitters (MEPRO),[2] Edward Spear, and 24 other individual stakeholders.

On April 27, 2022, GLHA filed a response to comments on the RSP.

General Comments

Some comments on the RSP do not directly address study plans. For example, some comments provide additional information, request additional information or clarification from GLHA, or recommend protection, mitigation, and enhancement measures. This determination does not address such comments, but only addresses comments specific to the merits of the proposed studies submitted pursuant to section 5.13 of the Commission's regulations and received thereon.

Study Plan Determination

Of the 20 studies proposed by GLHA, 8 are approved as filed and 12 are approved with staff-recommended modifications. This determination also approves: (1) FWS's request for a Terrestrial, Wildlife, and Botanical Resources Study, with staff-recommended modifications; (2) Maine DEP's and Maine TU's request for a Fish Assemblage Study for the Ripogenus Project, with staff recommended modifications;

[2] MEPRO requests a Carbon Sequestration Study and a Wetted Width Study for the Projects. In both instances, the requests are vague and do not follow the study criteria outlined in section 5.9(b) of the Commission's regulations. Therefore, these two studies are not considered in this Study Plan Determination.

(3) the Penobscot Indian Nation's request for a socioeconomic study, with staff-recommended modifications; and (4) Maine TU's request for a fish stranding study downstream from McKay Station. The determination also denies requests for 13 additional studies recommended by stakeholders (*see* Appendix A). The specific modifications to the study plan, and the bases for modifying GLHA's study plan, as well as modifying, adopting, or not adopting requested studies, are discussed in Appendix B. Although Commission staff reviewed all comments and considered all study plan criteria in section 5.9 of the Commission's regulations, only the specific study criteria particularly relevant to the determination are referenced in Appendix B.

Study issues raised in comments on the PSP, but not again in comments on the RSP, are considered to be resolved, and, therefore, those issues are not discussed in this determination. Unless otherwise indicated, all components of the approved studies not modified in this determination must be completed as described in the RSP. Pursuant to section 5.15(c)(1) of the Commission's regulations, the initial study report for all studies in the approved study plan must be filed by May 13, 2023.

Nothing in this study plan determination is intended, in any way, to limit any agency's proper exercise of its independent statutory authority to require additional studies. In addition, GLHA may choose to conduct any study not specifically required herein that it feels would add pertinent information to the record.

If you have any questions, please contact Allan Creamer at (202) 502-8365, or at allan.creamer@ferc.gov.

Sincerely,

for
Terry L. Turpin
Director
Office of Energy Projects

Enclosures: Appendix A – Summary of Determinations on Proposed and Requested Studies
Appendix B – Staff Recommendations on Proposed and Requested Studies
Appendix C – Ripogenus Project and Penobscot Project Historical Generation Data
Appendix D – Environmental Justice Study Methodology
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## APPENDIX A

## SUMMARY OF DETERMINATIONS ON PROPOSED AND REQUESTED STUDIES

| Study | Recommending Entity | Approved | Approved with Modifications | Not Required |
|---|---|---|---|---|
| 1. Historic Operations Data Assessment | GLHA | | X | |
| 2. Operations Model | GLHA | | X | |
| 3. Indicators of Hydrologic Alteration Model | NMFS | | | X |
| 4. Ramping Rate Study | Edward Spear | | | X |
| 5. Fish Stranding Study | Maine TU | X | | |
| 6. Impoundment Trophic State Study | GLHA, Maine DEP | X | | |
| 7. Impoundment Aquatic Habitat and Species Assessment | GLHA, Maine DEP, FWS, Maine DIFW | | X | |
| 8. Downstream Water Temperature and Dissolved Oxygen Study | GLHA, Maine DEP | X | | |
| 9. Riverine Aquatic Habitat Assessment | GLHA, Maine DEP, Maine DIFW | X | | |
| 10. Benthic Macroinvertebrate Assessment | GLHA, Maine DEP, Maine DIFW | | X | |
| 11. River Temperature in West Branch and Mainstream Penobscot River Study | NMFS | | | X |
| 12. Future Flow and Water Temperature Scenarios/ Climate Change Study | NMFS | | | X |
| 13. Fish Assemblage Study | Maine DEP (for Ripogenus only), Maine TU | | X | |

| Study | Recommending Entity | Approved | Approved with Modifications | Not Required |
|---|---|---|---|---|
| 14. Instream Flow and Habitat Assessment of West Branch Downstream of Stone Dam Study | GLHA, Maine DIFW, Edward Spear | | X | |
| 15. North Twin Impoundment Tributary Access Survey | GLHA, Maine DIFW | X | | |
| 16. Ripogenus Impoundment Zooplankton Study | Edward Spear | | | X |
| 17. 3-D CFD Model | FWS, Maine DMR | | | X |
| 18. Upstream Eel Passage Assessment Study | GLHA, FWS, Maine DMR | | X | |
| 19. Desktop Downstream Eel Passage Route and Survival Study | GLHA, FWS, Maine DMR | X | | |
| 20. Evaluation of Eel Size and Timing of Downstream Migratory Movement | FWS, Maine DMR | | | X |
| 21. Downstream Eel Passage Alternatives Study | FWS | | | X |
| 22. Upstream Fish Passage Alternatives Study | Maine DMR | | | X |
| 23. Downstream Fish Passage Alternatives Study | Maine DMR | | | X |
| 24. Freshwater Mussel Survey | FWS | | | X |
| 25. Terrestrial, Wildlife, and Botanical Resources Study | FWS | | X | |
| 26. Wood Turtle Habitat and Presence Study | GLHA, Maine DIFW | | X | |

| Study | Recommending Entity | Approved | Approved with Modifications | Not Required |
|---|---|---|---|---|
| 27. Riparian and Littoral Habitat Assessment Study | GLHA | | X | |
| 28. Marsh Bird Survey Study | GLHA, Maine DIFW | X | | |
| 29. Furbearer Survey Study | GLHA Maine DIFW | | X | |
| 30. Common Loon Productivity Assessment | Maine DIFW | | | X |
| 31. Common Loon Management Plan Assessment Study | GLHA, Maine DIFW | X | | |
| 32. Recreation Study | GLHA, AW/AMC, Maine ACF | | X | |
| 33. Whitewater Boating Assessment Study | GLHA, AW/AMC, Alexander Horne, Ben Koehler, Chris Howe, | | X | |
| 34. Aesthetics Study | GLHA, AW/AMC | | X | |
| 35. West Branch Penobscot River Creel Survey | Edward Spear | | | X |
| 36. Historic Architectural Survey | GLHA, Maine SHPO | X | | |
| 37. Socioeconomic Study/Environmental Justice Assessment | Penobscot Indian Nation, FERC | | X | |

# APPENDIX B

# STAFF RECOMMENDATIONS ON PROPOSED AND REQUESTED STUDIES

## I. Requests for Proposed Study Plan Modifications and Requests for Additional Studies

### Study 1. Historic Operations Data Assessment

Applicant's Proposed Study

GLHA's stated goal of this study is to compile relevant "historic" operations data for each development of the Ripogenus Project and the Penobscot Mills Project (collectively, the Projects) to allow stakeholders to better understand historic operations. GLHA would identify available operational data for the Projects dating no further back than January 1, 1997, which was shortly after the current licenses were issued on October 22, 1996. For each development, GLHA would develop graphics of impoundment elevations and downstream flows. GLHA states that they would use the data to evaluate historic operations in relation to current license requirements. The study would be initiated in 2022, with study results provided in the initial study report (ISR) to be filed by May 13, 2023.

Comments on the Study

None.

Discussion and Staff's Recommendations

The current licenses for the Projects allow for flexibility in operations, particularly with respect to reservoir elevation limits (e.g., the Ripogenus impoundment has no regulatory limit on its drawdown). This flexibility, in combination with the shutdown of the Millinocket Paper Mill in 2008, and East Millinocket Paper Mill in 2013, warrants a review of the Projects' operations throughout the current license terms to identify the potential range of operations under current conditions. This information may also be useful in identifying alternative reservoir operating levels to be evaluated in GLHA's proposed Operations Model. The proposed Historic Operations Data Assessment should identify flow releases, reservoir elevation ranges, and generation; identify the ranges of these parameters during the current license term; and evaluate how these parameters may have changed during the current license terms.

GLHA's proposed study does not identify what "relevant historic operations data" would be included in this assessment, or the timestep for flow data. In the Revised Study

Plan (RSP), GLHA provided daily minimum, maximum, and average flow and elevation data for the Projects' developments for the 10-year period from January 1, 2010, through September 30, 2021. The RSP indicates that this information would also be provided for an additional 13 years, as far back as 1997. Daily average flow and elevation data would be sufficient to inform alternative operating scenarios to be evaluated in the Operations Model [section 5.9(b)(6)]. Therefore, we recommend that GLHA's proposed assessment be modified to include the additional 13 years (i.e., back to 1997) of daily minimum, maximum, and average flow and elevation data as available. The data should be provided in excel format and summarized graphically.

We have compiled average annual generation data for the Projects for the 24-year period from 1997 through 2021.[3] This information is attached in Appendix C, and because there would be no cost to GLHA [section 5.9(b)(7)], we recommend it also be included in the ISR.

The ILP regulations provide a procedure for modifying the study plan, as necessary, based in part, on the results of the first year of studies [sections 5.15 (d) and 5/15(e)]. Should GLHA's review and assessment of historical operations data prove insufficient in describing the Projects' historical operations, and data gaps in describing the Projects' operations remain, additional studies to obtain that information could be considered after ISR filing.

**Study 2. Operations Model**

Applicant's Proposed Study

GLHA proposes to develop a project operations model to simulate elevations for each of the Projects' impoundments under various operating constraints (i.e., minimum flows, various starting impoundment levels, and hydrology). GLHA proposes to develop the model using Computer Hydro Electric Operations and Planning Software (CHEOPS). CHEOPS models can be used to evaluate potential operating alternatives based on historic hydrology for the Projects. GLHA indicates that the model would support an evaluation of alternative operations at an hourly time step. Moreover, the model would estimate the degree to which different flow releases could be maintained at different starting elevations in the impoundments. The model would be developed in 2022, and a report describing the information and process used to develop the model provided in the ISR.

[3] Our preliminary evaluation of this data suggests that annual generation has been primarily based on flow availability (i.e., whether it was a wet/average/dry water year). No obvious changes in generation were identified after the Millinocket and East Millinocket Mills shut down.

Comments on the Study

In comments on the Proposed Study Plan (PSP) and RSP, multiple stakeholders request that GLHA provide hourly operations data at each development to better understand how the Projects operate.

Discussion and Staff's Recommendations

As a general matter, GLHA's proposed Operations Model would assist our assessment and consideration of potential operational alternatives under any new licenses for the Projects. However, the RSP lacks sufficient detail regarding how the input data would be determined or how the model would be calibrated. Additionally, the RSP does not identify opportunities for stakeholders to engage in the development, evaluation, specification of model runs, or review of model runs. Because this information is needed to inform the need for, and development of, license requirements [section 5.9(b)(5)], and adding these elements to the Operations Model can be done with little cost to GLHA [section 5.9(b)(7)], we recommend that the study plan for the Operations Model be revised to include these measures, as well as a detailed schedule for consulting with the stakeholders and responding to their concerns as the model is developed, and during the alternative development/evaluation process.

To facilitate our and the stakeholder's review and evaluation of the model's development, assumptions, and results [section 5.9(b)(6)], we recommend that GLHA include the model inputs, outputs, and assumptions with the ISR, or if that is technically infeasible, on a protected, cloud-based server with access granted to relicensing participants upon request.

Multiple stakeholders request hourly operations data for each of the Projects' developments. The RSP indicates that the model would accommodate an hourly time step, but provides no information on the details of the input data that would be used in the model. Understanding the inter-relationship between hourly project operations and the associated effects on environmental and developmental resources, is necessary to inform the development of license requirements [section 5.9(b)(5)].

We agree that an hourly timestep for operations data is appropriate, but recognize the extensive amount of data needed to include the entire period of record since the last license was issued. To minimize what would be an extensive amount of data [section 5.9(b)(7)], we recommend hourly data be used for representative years that captures dry flow-year operation, average flow-year operation, and wet flow-year operation. Table 1-1 in the RSP describes average annual flows and water year classification at the Projects for years 2001 through 2021. This information could be helpful in selecting

representative years for model runs; we recommend, at a minimum, one dry flow-year, one average flow-year, and one wet flow-year be modeled.

The ILP regulations provide a procedure for modifying the study plan, as necessary, based in part, on the results of the first year of studies [sections 5.15 (d) and 5/15(e)]. Additional water years could be considered after ISR filing.

**Study 5. Fish Stranding Study**

Requested Study

In its comments on the PSP, the Maine Council of Trout Unlimited (Maine TU) requests that GLHA conduct a Fish Stranding Study in the West Branch of the Penobscot River (West Branch) downstream from McKay Station.[4] Maine TU indicates that fish and invertebrate strandings have been documented downstream from McKay Station during low flow excursions that occur during generator shutdowns. Maine TU contends that these strandings may represent a source of fish mortality and injury. The goal of Maine TU's requested study is to determine the extent and harm of stranding pools that occur downstream from the McKay Station discharge to Nesowadnehunk Falls, particularly during 400-cubic-feet-per-second (cfs) generator trip events.[5] The study requested by Maine TU would involve a review of operational data to determine the range of flows at which generator trips at the McKay Station are likely to occur and field surveys to examine potential stranding sites and visually document any stranded fish.

[4] Maine TU requested a Flow Excursion Study for the Ripogenus Project to evaluate: (1) the consistency of flows from Ripogenus Dam as they relate to the project's current minimum flow requirements; and (2) the impacts of the 400-cfs generator outage flow on aquatic organisms. In the PSP, GLHA indicates that the proposed Historical Operations Data Assessment would address the questions regarding deviations from minimum flow requirements. In their comments on the PSP, Maine TU states that GLHA did not address the second component of their study request, evaluating the effects of the 400-cfs generator outage flow on aquatic organisms, and proposed a Fish Stranding Study. Based on Maine TU's comments on the PSP and RSP, we assume that the Fish Stranding Study request replaced their original Ripogenous Flow Excursion Study request.

[5] A minimum outage flow of 400 cfs (hourly average) is provided downstream of McKay Station in the event of an unplanned station trip or emergency requiring station shutdown. This outage flow is maintained until GLHA is able to restore minimum flows required under the current license.

Comments on the Requested Study

In its comments on the RSP, GLHA states that it does not propose to conduct Maine TU's requested Fish Stranding Study. GLHA indicates that information collected and reported from other proposed studies, such as the Historical Operations Data Assessment, will detail how the Ripogenus Project has been operated, including flows provided by McKay Station. Additionally, GLHA indicates that the fieldwork performed in the West Branch downstream from McKay Station for other studies would provide additional information regarding flows in the West Branch in relation to aquatic organisms.

Reply Comments

In comments on the RSP, Maine TU reiterated its request for a Fish Stranding Study, indicating that several fish stranding events have been documented downstream from McKay Station. Maine TU states that GLHA has the ability to eliminate strandings and provide "fish friendly" flows. Maine TU asserts that the information needed to improve conditions for fish health and survival can be provided through a combination of: (1) analysis of hourly operational data; (2) the flow studies requested by the National Maine Fisheries Service (NMFS); (3) the Ramping Rate Study proposed by Edward Spear; and (4) the Fish Stranding Study proposed by Maine TU.

Discussion and Staff's Recommendation

Rapid changes in flow and decreases in water surface elevation can increase the risk of fish and invertebrate stranding which may be stressful and/or lethal for aquatic organisms. While GLHA's proposed Historic Operations Data Assessment would help identify how the Ripogenus Project has been operated, it is unclear whether GLHA proposes to evaluate the conditions that could lead to low flows downstream of McKay Station. Further it is unclear how or what proposed studies would examine the potential effects of reduced flows and flow change rates on downstream fish and aquatic invertebrates.

Reviewing operational data would help to identify specific conditions that lead to generator shutdowns and any resulting low flows. Accompanying field surveys, developed in consultation with Maine TU and Maine DIFW, would provide a mechanism to evaluate the potential for, and magnitude of, fish and invertebrate stranding during generator shutdowns. Collectively, these results could inform the development of license requirements for emergency minimum flows and the rate at which downstream flows are increased or decreased, if necessary [section 5.9(b)(5)]. The potential effects of reduced flows and flow fluctuations are likely to extend, at a minimum, to the nearest large, downstream pool. Therefore, we recommend GLHA conduct the Fish Stranding Study

requested by Maine TU, through the area from McKay Station downstream to Nesowadnehunk Falls.

**Studies 6 and 8. Impoundment Trophic State Study and Downstream Water Temperature and Dissolved Oxygen Study**

Applicant's Proposed Studies

As a component of the Water Quality Study, GLHA proposes to conduct an Impoundment Trophic State Study and a Downstream Water Temperature and Dissolved Oxygen (DO) Study for the Ripogenus Project. GLHA's goal for the studies is to collect data sufficient to evaluate whether water temperature, DO, and other water quality parameters (e.g., total phosphorus, chlorophyll-a) are at levels consistent with those specified by applicable Maine water quality standards in the Ripogenus impoundment, the Upper Gorge (bypassed reach), and McKay Station tailrace.

As part of the Impoundment Trophic State Study, GLHA proposes to collect vertical profiles of water temperature and DO at the deepest areas of the six basins composing the Ripogenus impoundment using a handheld YSI ProSolo meter (or similar device). GLHA also proposes to monitor water temperature and DO in the Upper Gorge and the West Branch downstream from McKay Station with Onset HOBO data loggers (or similar devices). The data loggers would be programmed to continuously measure water temperature and DO once per hour through the low-flow, high-temperature period of July through August.

Comments on the Study

In his comments on the RSP, Edward Spear states that GLHA has not collected data necessary to review a Maine Department of Fisheries and Wildlife (Maine DIFW) recommendation that flows into the Upper Gorge be released from a deep gate, to provide cool water for landlocked salmon in the West Branch during the warm summer months, July and August. Mr. Spear recommends that GLHA place a recording thermometer[6] at a depth of 1-2 meters (or 3.3 to 6.6 feet) in the Ripogenus impoundment to collect water temperature data sufficient to characterize the differences among water surface, low-level, and mixed releases. This data would also be used to identify and assess methods (deep gate, siphon, etc.) to cool Upper Gorge summer flows.

Discussion and Staff's Recommendation

[6] For purposes of this discussion, we assume that Mr. Spear's proposed thermometer would be a continuous recording device placed in the Ripogenus impoundment.

GLHA is proposing to collect vertical profiles of water temperature at the deepest location in each of the basins composing the Ripogenus impoundment, including a station located in Ripogenus Lake just upstream from Ripogenus Dam. This effort, coupled with GLHA's proposed monitoring of water temperature in the Upper Gorge, both collected on a bi-monthly basis, should be sufficient to determine the effect of release location at Ripogenus Dam on the water temperature of flows released to the Upper Gorge [section 5.9(b)(6)] in a more cost-effective way [section 5.9(b)(7)], and in a broader spatial context than using a continuous recording device at a single location as recommended by Mr. Spear. Therefore, we do not recommend Mr. Spear's requested modification to GLHA proposed Impoundment Trophic State Assessment and Downstream Temperature and Dissolved Oxygen Assessment for the Ripogenus Project.

**Studies 7 and 13. Impoundment Aquatic Habitat Assessment and Fish Assemblage Study**

Applicant's Proposed Study

GLHA proposes to conduct an Impoundment Aquatic Habitat Assessment at the Projects, which would include littoral zone, macroinvertebrate, and fisheries surveys at the Ripogenus Project. GLHA's study goal is to document whether or not existing lake level management supports native species of fish and the structure and function of a healthy resident fish community. GLHA's proposed assessment would involve reviewing, compiling, and describing existing data, as well as anecdotal information collected from the Ripogenus impoundment by Maine DIFW and other organizations.

The issues to be addressed in GLHA's proposed study are similar to the issues addressed in fish assemblage study requests by the Maine Department of Environmental Protection (Maine DEP) and Maine TU, particularly for the Ripogenus Project. Therefore, our analysis of GLHA's Impoundment Aquatic Habitat Assessment is considered as part of our analysis of the requests for Fish Assemblage Studies, as discussed below.

Requested Study

In its study request, Maine DEP recommends a Fish Assemblage Study for the Ripogenus impoundment. The objective of Maine DEP's study is to determine if the Ripogenus impoundment "meets" Maine Water Quality Standards, including that the existing impounded waters are able to support all species of fish indigenous to those waters, to demonstrate, in part, attainment of the designated use of habitat for fish and other aquatic organisms. Maine DEP provides no methodology for its requested fish assemblage study, but instead requires that GLHA implement established study protocols used successfully throughout Maine by GLHA and others.

Maine TU requests that GLHA conduct a Fish Assemblage Study at each impoundment and riverine reach in the Projects' areas. Maine TU's goal for the study is to document the current fisheries assemblage in the Projects' waters for comparison with past studies. Maine TU's recommended study would involve gill netting, which it indicates is a standard, passive fish sampling method used to collect baseline fisheries data. Maine TU states that the existing information is over 40 years old, and that species composition may have changed over this time period due to: (1) changes in project operations (e.g., the magnitude or duration of impoundment drawdowns that limit the amount of littoral habitat and deep, oxygenated water available in the impoundments); (2) the spread of non-native, invasive fish species; and (3) climate change.

Comments on the Requested Study

In the RSP, GLHA does not propose to conduct Maine TU's requested Fish Assemblage Study, particularly the field sampling component. GLHA states that known information is adequate to characterize existing fish resources in the West Branch. GLHA notes that fish assemblage studies are not always required as part of relicensing a hydropower project. GLHA also states that there is no evidence that operation of the Projects contributes to the spread of non-native, invasive fish species. Finally, GLHA states that the use of gill netting as a method is not an appropriate technique to use in this instance, noting that gill netting is a passive technique that relies on fish movement and is affected by the mesh size of the net, so it would be highly selective in the size and type of fish sampled.

Reply Comments

In its comments on the RSP, Maine DEP states that: (1) the existing information would not be sufficient to demonstrate that the Projects[7] are currently "meeting" water quality standards; (2) the results of a Fish Assemblage Study would inform potential conditions that the Maine DEP could require in any water quality certificate issued for the Projects; and (3) Maine DEP does not provide specific methods for the study in its request because this type of study is commonly conducted in many Commission relicensing proceedings.

Maine TU requests that all reaches of the West Branch that are affected by the Projects (10 in total) be sampled, including the Ripogenus impoundment and the West Branch downstream from Ripogenus Dam and McKay Station, Millinocket Lake Storage

[7] Maine DEP's initial study request was for a Fish Assemblage Study in the Ripogenus impoundment. The agency's comments on the RSP suggests an expanded scope for the study, which would include all waters affected by the Projects.

Dam impoundment and Millinocket Stream, the North Twin impoundment and tailwater, the Millinocket impoundment and tailwater, the West Branch downstream from Stone Dam, the Dolby impoundment and tailwater, and the East Millinocket impoundment and tailwater. While Maine TU agrees that studies do not need to be duplicated, it states that GLHA has not provided a compilation of the fish assemblage studies that it claims currently exists.[8] Maine TU requests that GLHA compile information from all existing fish assemblage studies that have been conducted for the Projects and that GLHA assess this data for data gaps. Based on the outcome of the compilation of existing information, a decision regarding the need for new fish assemblage studies could be made.

Edward Spear states that 40-year-old data collected during a period of relatively stable flows has no value when (a) current operation involves peaking, and (b) lake level management has changed. Mr. Spear indicates that trap netting, electrofishing, and hydroacoustics, along with minnow traps, could provide the necessary information. For the Ripogenus impoundment rainbow smelt population, he suggests specifically that trawls, tows, hydroacoustics, and fine mesh vertical gill nets could be used. Mr. Spear also indicates that lake whitefish should be part of the fish assemblage assessment.

Discussion and Staff's Recommendations

With regard to the Penobscot Mills Project, there have likely been changes to the fish populations and communities in the project area since the studies were conducted about 40 years ago due to changes in Maine DIFW's fisheries management focus and species introductions (e.g., smallmouth bass). While the Preliminary Application Document (PAD) contains some fisheries information for the Penobscot Mills Project area, it appears that a full compilation of the fish assemblage studies conducted during the current license term has not been completed. Additional existing information sources include, at a minimum, recent creel survey data for the West Branch watershed. Therefore, we recommend that GLHA: (1) compile the information from all fish assemblage studies in the Penobscot Mills Project area that have been conducted during the current license term; and (2) assess the information for any data gaps in the fisheries information. The compilation of existing fish surveys and associated assessment should be a component of a Fish Assemblage Study Report, as described below, and filed as part of the ISR.

[8] In its response in the RSP to Edward Spear's request for a creel survey, GLHA indicates that Maine DIFW conducts creel surveys in the West Branch watershed, including in the Ripogenus Project area. GLHA, as part of the fisheries assessment for the Water Quality Study, proposes to "compile and synthesize fisheries data for the Ripogenus Project Area, including any recent creel survey data that may not have been discovered during PAD development."

Although we do not recommend fish assemblage studies for the Penobscot Mills Project, at this time, the ILP regulations provide a procedure for modifying the study plan, as necessary, based in part, on the results of the first year of studies [sections 5.15 (d) and 5/15(e)]. Therefore, if GLHA's compilation of fish assemblage studies for the Penobscot Mills Project proves insufficient for achieving the goal of sufficiently describing the existing fishery, and important data gaps in the fisheries information for the project are identified, additional studies to obtain that information could be considered after ISR filing.

Regarding the Ripogenus Project, there have likely been changes to the fish populations and communities in the project area since studies were conducted about 40 years ago due to changes in project operation, which would render those study results insufficient [section 5.9(b)(4)]. Therefore, we recommend that GLHA conduct a Fish Assemblage Study for the Ripogenus Project that covers all of the sub-basins of the Ripogenus impoundment, the Upper Gorge, and the West Branch downstream to Nesowadnehunk Falls (*see* above discussion for the Fish Stranding Study). Our recommended study for the Ripogenus Project includes:

- Conducting fish assemblage sampling, using electrofishing surveys, as well as other established methods (e.g., trawls, trap/fyke nets). Sampling should occur in the spring, summer, and fall to collect resident rainbow smelt, upstream and downstream migrating American eels (eels), and annual juvenile fish production. GLHA should establish sampling locations and final methods in consultation with the Maine DIFW, Maine DEP, and the U.S. Fish and Wildlife Service (FWS), to ensure that the sites represent the range of habitat types within the study area.

- Identifying to species and counting all fish collected and weighing and measuring a subsample of those fish; measuring eye diameters of captured eels for use in the evaluating eel phase; assessing fish condition; recording the habitat type and substrate of each sampling location; and recording in-situ water quality conditions [water temperature, DO, pH, and conductivity].

- Preparing a Fish Assemblage Study Report, including a summary of the data; tabular listings of fish species collected by sampling location; fish lengths, weights, and condition factors; and habitat and water quality conditions. Reporting specific information on eel population characteristics, such as timing, size, and abundance of upstream and potential downstream migrants.

- Including all data used to develop the report (including date and time of collection) in an appendix, and filing the report and appendix as part of the ISR.

We do not recommend Maine TU's approach of using gill netting for fish assemblage sampling. While this method of capturing fish is an accepted practice in the

scientific community and would provide some consistency with past methods, gill netting is a passive sampling technique, and as such, it would most likely provide only limited presence/absence data on a subset of the fish species that occupy the Ripogenus impoundment and other project-affected reaches of the West Branch [section 5.9(b)(6)]. Additionally, gill netting is typically lethal to the sampled fish, because by design fish are entangled in the nets by their gills.[9] Therefore, there is risk of harming populations of cold-water fish, which is the primary fishery in the project area. Though this information might address Maine TU's goal of sampling to compare new data with old, less lethal methods that target a broader range of fish species are available to meet the study goals, as noted above.

Our recommendation regarding the Fish Assemblage Study incorporates the issues that GLHA proposed to address with its Impoundment Aquatic Habitat Assessment Study for the Ripogenus Project, specifically the Fisheries Assessment. Therefore, a separate data collection effort for the Fisheries Assessment, as proposed by GLHA, is unnecessary.

**Study 10. Benthic Macroinvertebrate Assessment**

Applicant's Proposed Study

As a component of the proposed Water Quality Study, GLHA proposes to conduct a Benthic Macroinvertebrate Assessment to determine the composition of the benthic macroinvertebrate community within the Upper Gorge and the West Branch to about 1,000 feet downstream from McKay Station. The objective of GLHA's study is to evaluate whether aquatic life criteria are attained under existing operations. GLHA would use wading or snorkeling to assess the two reaches and identify suitable sampling locations. GLHA would establish one monitoring station with three replicate samplers (e.g., rock basket or bag) in the Upper Gorge and one station with three replicate samplers downstream from McKay Station. Samplers would be deployed and left in the river to colonize for approximately 28 ± 4 days between July 1 and September 30.

Comments on the Study

In his comments on the RSP, Edward Spear states that GLHA's proposed study is not consistent with the Maine DIFW's study request.[10] In particular, Mr. Spear explains

[9] RSP at 6-16.

[10] We assume that where Mr. Spear cites to GLHA's proposed Riverine Aquatic Habitat Assessment in his comments pertaining to macroinvertebrate sampling at the Ripogenus Project, he intends to refer to GLHA's proposed Benthic Macroinvertebrate

that GLHA is proposing reduced sampling effort, and that GLHA would only sample at one location downstream from McKay Station. Mr. Spear states that the one location downstream from McKay Station is not representative of 20-plus miles of the West Branch downstream from the Ripogenus Project.

Discussion and Staff's Recommendation

Regarding the details of the study methodology, GLHA proposes to use sampling procedures for benthic macroinvertebrates that are consistent with Maine DEP's *Methods for Biological Sampling and Analysis of Maine's Rivers and Streams* (Davies and Tsomides, 2014), which identifies field and laboratory methods, exposure periods, preservation techniques, statistical decision models, quality control, and reporting requirements. Maine DIFW, in its comments on the RSP, states that its requested macroinvertebrate study is "satisfied by the proposed Water Quality Study" filed by GLHA with its RSP.

Regarding the representativeness of GLHA's sampling location in the West Branch downstream from the Ripogenus Project, channel shape and habitat conditions in the West Branch may be different than those in the McKay Station tailrace [section 5.9(b)(5)]. For example, velocities in the McKay Station tailrace (within 1,000 feet downstream from McKay Station) may be higher than in the downstream river reaches, which would result in different substates in the tailrace than in the river further downstream. Adding additional downstream monitoring sites [section 5.9(b)(6)] would provide information necessary to address the effects of project operation on macroinvertebrates, and would not add significantly to the cost of study [section 5.9(b)(7)]. Therefore, we recommend that GLHA, in consultation with the Maine DIFW and Maine DEP, identify and sample two additional locations in the West Branch downstream to Nesowadnehunk Falls (*see* above discussion for the Fish Stranding Study), consistent with the macroinvertebrate sampling protocol being used for the Upper Gorge.

**Study 14. Instream Flow and Habitat Assessment of the West Branch Downstream of Stone Dam Study**

Applicant's Proposed Study

GLHA proposes to conduct an Instream Flow and Habitat Assessment of the West Branch Downstream of Stone Dam Study. The goal of the study is to assess the relationship between flow and aquatic habitat in the West Branch downstream from Stone

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Assessment, which describes the protocol for sampling macroinvertebrates downstream from Ripogenus Dam.

Dam using a standard and accepted methodology, such as the Instream Flow Incremental Methodology (IFIM). The specific objectives of the study include: (1) assessing the relationship between flow and aquatic habitat for brook trout and landlocked salmon in the West Branch downstream from Stone Dam; (2) assessing the effects of current Penobscot Mills Project operation, including minimum flows, on the potential to support a coldwater fishery in the West Branch between Stone Dam and Grand Falls; and (3) evaluating potential alternative minimum flows in the West Branch downstream from Stone Dam to support a seasonal coldwater sport fishery.

GLHA proposes to use the 1989 IFIM Study and Physical Habitat Simulation (PHABSIM) model data to analyze habitat suitability associated with the existing minimum flows, as well as alternative minimum flows. Modeling would be conducted using standard procedures described by Bovee (1982) and Bovee *et al.* (1998). The focus of the flow-habitat modeling would be the adult life stage of landlocked salmon and brook trout. The prior IFIM Study included hydraulic data collected at 12-14 transects, and modeled mesohabitat features such as rapids and runs at two study sites, each representing a range of channel slopes, widths, and cover conditions observed in the West Branch. The flows simulated in the model would range from 3 to 2,000 cfs. GLHA would evaluate minimum flows in the West Branch downstream from Stone Dam in collaboration with a study team including Maine DIFW, Maine DEP, and other interested stakeholders. The study team would review the existing PHABSIM model and provide input regarding suitability criteria for adult brook trout, macrohabitat[11] and mesohabitat factors, increments of flow to be modeled, and other technical details.

Comments on the Study

In his comments on the RSP, Edward Spear requests that benthic macroinvertebrates be included in the list of aquatic organisms to be evaluated as part of the flow study. Mr. Spear specifically recommends the use of hydropsyschidae caddisflies. In addition, Mr. Spear requests that all life stages of salmon be included in the modeling effort. Finally, Mr. Spear requests to be part of the study process.

Discussion and Staff's Recommendation

Landlocked salmon in the West Branch drainage are primarily of self-sustaining origin; thus, life stages other than the adult life stage (e.g., larval and juvenile salmon) likely depend upon habitat in this reach of the West Branch. Flow releases from Stone Dam could influence aquatic habitat suitability within the channel for both salmon and brook trout. Yet, little is known about the suitability of the West Branch downstream

[11] Macrohabitat includes water quality, such as temperature in the stream, local meteorological conditions, stream network configuration, and the flow regime.

from Stone Dam, at existing and alternative flows, to support all life stages of salmon and their food source [section 5.9(b)(4)]. Stanley and Trial (the latter of Maine DIFW) issued the publication, *Habitat suitability index models: nonmigratory freshwater life stages of Atlantic salmon*, in 1995, as a third-generation report on habitat suitability indices (HIS) for landlocked salmon. HSI models are readily available for brook trout life stages, as well. Thus, HSI curves for different life stages of landlocked salmon and brook trout can be applied to the West Branch habitat characteristics to analyze habitat quality for those species and life stages.

Even less is known about the forage base for landlocked salmon and brook trout in the West Branch. hydropsychidae, referred to by Mr. Spear, is a family of omnivorous caddisflies whose larvae feed and grow in streams and rivers by spinning nets out of which they gather particles of edible material drifting by from upstream. They are a common food source for fish in both warm and coldwater streams (McCafferty, 1983). The habitat needs of hydropsychidae can also be applied to the West Branch habitat characteristics to analyze habitat quality for those larvae. While the HSI curves for hydropsychidae may not be as readily available, there is broad literature on the caddisfly family, including some HSI values, that can support a similar, if not equivalent, analysis to what should be achievable for the fish.

In the list of species/life stages to be evaluated as part of the study, GLHA does not include macroinvertebrates or other life stages of salmon that are likely to inhabit the West Branch. Adding hydropsychidae and other life stages of landlocked salmon to the study is important, because: (1) hydropsychidae is a key forage item for fish in the West Branch; and (2) the landlocked salmon fishery is the premier fishery in the West Branch [section 5.9(b)(6)]. Because (a) the cost of adding hydropsychidae and other life stages of landlocked salmon to the study design would likely be small (because existing information can be used) [section (b)(7)], and (b) the information that would be derived from adding hydropsychidae caddisflies and multiple life stages of Atlantic salmon could assist our understanding the effects of flow releases on the cold-water fishery in the West Branch, we recommend GLHA's proposed Instream Flow and Habitat Assessment of the West Branch Downstream of Stone Dam Study be expanded. Specifically, we recommend that hydropsychidae and other life stages of landlocked Atlantic salmon be evaluated as part of the IFIM modeling effort.[12]

With regard to Mr. Spear's request to be part of the study process, GLHA proposes to evaluate minimum flows in the West Branch downstream from Stone Dam in

[12] The intent of our recommendation is that GLHA make a good faith effort to mine existing suitability information for hydropsychidae and attempt to develop the HSI information based on that existing data. It is not our intent at this time that GLHA be required to conduct field studies to develop the hydropsychidae HSI information.

collaboration with a study team that includes state agencies with resource management responsibilities (i.e., Maine DIFW and Maine DEP), as well as interested stakeholders. Maine DIFW and Maine DEP have sufficient expertise to review the existing PHABSIM model and provide input regarding suitability criteria for the list of species to be evaluated. Therefore, we do not recommend that GLHA's proposed study plan, with specific regard to consultation, be modified as requested by Mr. Spear.

**Study 15. North Twin Impoundment Tributary Access Study**

Applicant's Proposed Study

GLHA proposes to conduct a North Twin Impoundment Tributary Access Study. GLHA's goal for the study is to assess connectivity and spawning conditions for landlocked salmon in tributaries to the North Twin impoundment, and determine if there are barriers to movements into the tributaries exposed during drawdowns of the North Twin impoundment. The specific objectives are to: (1) identify tributaries to the North Twin impoundment that are used by landlocked salmon for spawning or that have habitat suitable for spawning; (2) survey the identified tributary streams and identify potential fish passage barriers both natural and project-related near their confluence with the North Twin impoundment; (3) document evidence of spawning (e.g., spawning behavior and redd formation); and (4) evaluate the effects of the typical seasonal impoundment fluctuation on tributary access by landlocked salmon during critical life stage.

The preliminary list of tributaries GLHA would survey includes the West Branch upstream of the Ripogenus impoundment, Nahmakanta Stream, Partridge Brook, and Jo Mary Stream. The final list of tributaries, however, would be developed in consultation with Maine DIFW. The mouth of the identified tributaries would be: (1) assessed for potential barriers to adult landlocked salmon movement (e.g., ledge drops, debris jams, and wide shallow channel reaches); and (2) surveyed to obtain slope and channel width elevations (via optical survey) during the spring or early summer with full, or nearly full, impoundment conditions. The same tributaries would be assessed and surveyed again in the fall spawning period under seasonal drawdown conditions. Water depths in the shallowest channel zone, and minimum wetted widths, would be surveyed and recorded along the longitudinal axis of each stream, and restrictions would be photographed and geolocated using a Global Positioning System (GPS) device. GLHA would determine stream flow at the time of the survey, and document impoundment elevation. Finally, GLHA would examine the stream reach immediately above the high-water mark (i.e., within the first 328 feet) in each tributary to identify potential spawning habitat and/or evidence of redd construction. This information would be documented in field notes, and locations would be photographed and located with GPS.

Comments on the Study

In its comments on the RSP, Maine DIFW states that it continues to recommend a Landlocked Salmon Radiotelemetry Study for the North Twin impoundment that it requested in its October 8, 2021 study request, and in its February 22, 2022 comments on the PSP. Maine DIFW's goals for the study are to: (1) track seasonal movements and behaviors of landlocked salmon (within and between the five connected lakes) via radiotelemetry; (2) determine the effects of annual project drawdown on the movement and behaviors of landlocked salmon within the North Twin impoundment; and (3) identify landlocked salmon spawning areas within the North Twin impoundment.

Maine DIFW states that the effects of Penobscot Mills Project operation on landlocked salmon spawning movement and behavior, as well as selection of spawning tributaries, in the North Twin impoundment is unknown. Maine DIFW argues that GLHA's proposed study, without radiotelemetry, would not identify spawning activity within slack water areas of the North Twin impoundment. It also would not detect any potential movement downstream out of the North Twin impoundment (via the North Twin powerhouse or dam) during the fall spawning period. Maine DIFW indicates that this information would help identify potential downstream salmon movement and assess the effectiveness of the North Twin fishway to pass salmon back upstream into the impoundment after spawning.

In his comments on the RSP, Edward Spear states that he supports Maine DIFW's request for a Landlocked Salmon Radiotelemetry Study for the North Twin impoundment. Mr. Spear states that it is the only method to determine potential project effects on salmon movement, access to spawning areas, as well as spawning timing and success. Mr. Spear states that there are only two North Twin impoundment tributaries, with a possible third, that have the flow and size capable of supporting significant salmon reproduction. Finally, Mr. Spear states that collecting enough salmon suitable for radio-tagging would be relatively simple, and radio tracking would produce thousands of data points over the 4- to 8-week pre-spawning and spawning periods.

In the RSP, GLHA states that a Radiotelemetry Study is not necessary to document the timing of spawning, as the timing of landlocked salmon spawning is reasonably well known. The intent of the study is to document use of, and access to, tributaries of the North Twin impoundment during spawning season. GLHA asserts that, while tracking seasonal movements of salmon via radiotelemetry and collecting landlocked salmon population dynamics data would be useful fishery management information, it is not necessary to assess the effects of project operation on landlocked salmon spawning.

Discussion and Staff's Recommendations

Annual drawdowns of about 12 feet begin on October 15 and continue to the spring (PAD at page 4-48). Therefore, the drawdown overlaps the landlocked Atlantic

Salmon spawning season of mid-October to late November. Lake level management in the North Twin impoundment, particularly the 12-foot drawdown, could affect landlocked salmon spawning success by influencing the volume and accessibility of spawning habitat.

Boucher and Warner (2006) suggest that the adult salmon of wild origin in the North Twin impoundment may be more likely to use spawning habitat associated with inlet streams for spawning than other spawning habitats. Landlocked salmon in the North Twin impoundment are primarily wild origin fish (PAD at page 5-93). Therefore, tributaries are likely the dominant spawning areas for landlocked salmon in the impoundment.

Tributary spawning adult salmon must have passage from the open water of the impoundment to the flowing water in the tributary. Movement to spawning areas is triggered by falling water temperature. In the flowing tributaries, female salmon typically build the redds (nests) at the head of a riffle or the tail of a pool where the water is accelerating (Warner and Havey, 1985), because redds require continuous well-oxygenated water (PAD at page 5-92). Based on the PAD, there is limited information on the aquatic habitat in the tributaries, and whether or not access is restricted during drawdown [section 5.9(b)(4)]. Observations of the tributary inlets at full pond and during drawdown, with particular attention to any structural or hydraulic barriers, would provide practical insight into the ability of salmon to access tributary spawning habitat. A comparison of access and habitat quality at full pool versus in a drawdown state could help to identify potential operational, or on-site measures to improve spawning access [section 5.9(b)(5)].

Landlocked salmon are believed to use habitat other than tributaries for spawning, particularly when access to tributary habitat is limited. Other possible spawning areas include shoal areas in the impoundment and the tailrace and riverine areas downstream from the dam. In order to explore salmon movement, behavior, and use of these other potential habitats, as well as tributaries, Maine DIFW requests, and Mr. Spear supports, the Radiotelemetry Study. A radiotelemetry study could track movement of salmon and potentially detect spawning behavior in these areas. However, such a study would have a significantly higher cost than that proposed by GLHA [section 5.9(b)(7)], and it is unclear how a telemetry study would lead to operational or site-specific changes [section 5.9(b)(5)].

Regarding shoal spawning habitat, Maine DIFW states that there is documented evidence that salmon would spawn in impoundments, especially near the mouths of large inlets, in moving water near outlets, and among wind-swept shoals. The PAD shows that there is substrate in the impoundment of the proper size for salmon spawning. Spawning habitat for landlocked salmon consists of areas of unimbedded gravel areas containing substrate ranging from 0.5 to 4 inches in diameter and being well oxygenated (PAD at

page 5-92). GLHA proposes to examine spawning habitat in the tributary inlets and assess conditions for 328 feet up the tributary during site visits for nearly full pool and drawdown conditions. To capture information on shoal habitat, during the drawdown site visit (only) GLHA also could identify for shoal habitat in the area extending 328 feet in the opposite direction, going out from the tributary, into the inlet and toward the open water of the impoundment. In this area, GLHA could identify, photograph, locate with GPS, and assess: (1) shoal spawning habitat apparent at the time of the drawdown site visit; and (2) potential shoal spawning habitat that would exist at higher pool levels that is out of the water and exposed under the drawdown site visit conditions. Because, by definition, these areas would be within 328 feet of the tributary mouth, shallow or exposed, and with hard substrate, they could be waded to or accessed in a small boat. Because salmon that spawn on shoals often do so in tributary inlets, adding this information gathering to GLHA's study would provide some information on the potential for landlocked salmon to spawn on the shoals of the impoundment [section 5.9(b)(6)].

Regarding spawning in the West Branch downstream from North Twin Dam, Maine DIFW states that adult salmon of the North Twin impoundment pass the North Twin Dam going downstream, spawn in the dam tailrace or other areas in the West Branch, and return to the impoundment via the fish ladder. Landlocked salmon are found infrequently downstream from North Twin Dam and are believed to be incidental drop-down individuals. The small number of salmon that inhabit Quakish Lake, Dolby Pond, Millinocket Stream, East Millinocket impoundment, and other riverine reaches of the Penobscot Mills Project area are mostly of hatchery origin. Adult salmon for the radio telemetry work would need to be wild fish caught from the North Twin impoundment. Collecting, tagging, and tracking (with radiotelemetry) an adequate sample size of pre-spawning salmon would be a substantial effort, given the relatively low likelihood that drop-down spawning is a major source of spawning for the impoundment [section 5.9(b)(6)].

In summary, GLHA has proposed a less costly study than the one recommended by Maine DIFW, but it would achieve the common goal of helping to identify operational or onsite protection, mitigation, and enhancement (PM&E) measures. In addition, GLHA's study could also be adapted to make an initial assessment of shoal spawning habitat in the slack water impoundment inlet areas [sections 5.9(b)(7) and 5.9(b)(5)]. The evidence of large-scale dropdown spawning is limited, likely because Maine DIFW stopped stocking the impoundment in favor of natural reproduction in 2018. Finally, Maine DIFW's goals for the Radiotelemetry Study do not appear to be project-related [section 5.9(b)5)].

For all of the above reasons, we do not recommend the Landlocked Salmon Radiotelemetry Study requested by Maine DIFW and supported by Mr. Spear for the North Twin impoundment. Rather, we recommend adopting GLHA's North Twin Impoundment Tributary Access Study. However, we recommend that, in addition to the

study as proposed, a provision be added to assess shoal spawning habitat 328 feet into the impoundment from the line of transition from flowing tributary to slackwater inlet under drawdown conditions. Details of this study provision should be developed in consultation with Maine DIFW.

**Study 18. Upstream American Eel Passage Assessment Study – Presence, Distribution, and Relative Abundance of Juvenile American Eel**

Applicant's Proposed Study

GLHA proposes to conduct an Upstream American Eel Passage Assessment, which would assess the presence, distribution, and relative abundance of juvenile eel in the West Branch. GLHA's goal for the study is to assess whether eel: (1) are found in, or near, the East Millinocket Development's tailwater area; (2) congregate at, or near, the base of the East Millinocket Dam; or (3) attempt to migrate upstream over or around the East Millinocket Dam. GLHA's proposed study would include nighttime visual and boat electrofishing surveys (from June through August), and the use of eDNA[13] techniques to determine if juvenile eel are present at the East Millinocket Development and, if so, their approximate size, abundance, and distribution.[14] GLHA states that, because eel attempting to migrate into the West Branch would first need to pass the East Millinocket Dam, "documenting their abundance and distribution at this location represents a logical first step in assessing the resource issue and potential effects of Project operations."

GLHA also would use eDNA techniques described by Chin *et al.* (2021) to assess the presence and relative abundance of eel in the West Branch. GLHA proposes a pilot eDNA effort to determine whether a positive association between eDNA and the numerical abundance of eels can be demonstrated in the lower Penobscot River (where there is a higher abundance of juvenile eel) and near the East Millinocket Development. To assess the potential association between eDNA concentration and numerical

[13] Environmental DNA (eDNA) is organismal DNA that can be found in the environment. Environmental DNA originates from cellular material shed by organisms (via skin, excrement, etc.) into aquatic or terrestrial environments that can be sampled and monitored using new molecular methods. Such methodology is important for the early detection of invasive species as well as the detection of rare and cryptic species.

[14] The study area for the eDNA pilot study includes select reaches of the West Branch (downstream from the East Millinocket Development), the lower East Branch of the Penobscot River, and mainstem Penobscot River.

abundance, GLHA would use a single methodology[15] to assess the relative abundance of eels at each site at the time of eDNA collection. If a significant positive association between eDNA concentration and relative abundance of eels in the lower Penobscot River is established, GLHA would consult with the resource agencies on the need for additional eDNA monitoring to estimate the spatial distribution and relative abundance of eel within the Penobscot Mills Project area.

Comments on the Study

In its comments on the RSP, FWS states that the general abundance and distribution of eels at the Projects is not in question. FWS notes that the West Branch was historic habitat for eel and the species currently inhabits the projects' impoundments and West Branch river habitat (FERC, 1996; Yoder *et a*l., 2008).

FWS asserts that upstream eel passage siting surveys are needed to determine the optimal locations for locating permanent upstream eel passage facilities at each of the six dams of the projects.[16] In a letter filed October 8, 2021, Maine DMR requests a similar study. The agencies recommend visual surveys for eels staging in pools or attempting to ascend wetted structures downstream, baited eel pots, and using temporary trap/pass devices to find viable sites for permanent eel trap/passage structures.

In the PSP, GLHA responded to FWS's and Maine DMR's request by citing to MBI (2005), which found that eel accounted for about 1 to 2 percent of the total catch in the West Branch. GLHA reports that the Medway Project No. 2666, which is located 0.8 miles downstream from East Millinocket Dam, and is equipped with an upstream eel ladder, passed a total of 88 eel between 2004 and 2015. GLHA concludes that eel likely occurs in low numbers in the Projects' waters. Thus, because little is known about eel distribution in the West Branch, GLHA argues that the surveys requested by the agencies at all six of the Projects' dams would not be productive, and that siting upstream eel passage facilities for the Projects would be unwarranted at this time.

In comments on the RSP, Maine TU states that the presence of eel in the watershed is well established. Maine TU asserts that GLHA is taking a study request that would inform licensing decisions for the projects and replacing it with a study that will not.

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[15] Depending on permitting, GLHA would use either a fixed distance electrofishing sample (e.g., 30-meter shoreline transect), or a series of eel pots deployed at each site for a fixed duration (e.g., 96-hour)

[16] The six dams at the two projects are the Ripogenus (of the Ripogenus Project) and the North Twin, Millinocket, Dolby, East Millinocket, and Millinocket Lake Storage Dams (of the Penobscot Mills Project).

Discussion and Staff's Recommendations

GLHA, FWS, and Maine DMR agree that an upstream eel passage assessment is warranted to support the relicensing of the Projects. However, GLHA's proposed study plan, and the agencies' recommended study plan, differ in several key areas. They also agree that observations of eel presence, abundance and behavior are needed in the tailrace of East Millinocket Dam. They disagree on: (1) whether or not the scope of the study needs to include the five dams upstream of East Millinocket Dam; (2) the seasonality of sampling; and (3) important details of the sampling methodology.

*Study Scope*

As documented in the PAD, eel are known to occur throughout the Projects' impoundments and flowing reaches of the West Branch. However, existing information from MBI (2005) and the Medway Project eel counts suggest that eel occur in low numbers in the project waters. If that has changed over time, it is likely detectable in the tailrace of East Millinocket Dam, where GLHA and the agencies agree that monitoring is needed. Given the indications that eel abundance is very low in the project waters, surveys at the five upstream dams at this time would be overly costly [section 5.9(b)(7)], given the limited information expected to be gained for the purpose of siting and installing upstream eel ramps [section 5.9(b)(5)]. Therefore, we recommend that GLHA conduct tailrace sampling for eel only at East Millinocket Dam.

*Seasonality of Sampling*

GLHA and the agencies agree that developing a better understanding of eel migration cues and their seasonality is important information to manage eel passage in the West Branch. While GHLA and the agencies may agree on this point, they do not agree on the seasonality for sampling upstream migrating eel. GLHA proposes monitoring for juvenile eels moving upstream in June through August. The agencies recommend a monitoring period of April 1 through November 30, which would extend GLHA's proposed period by 5 months, 2 in the spring and 3 in the fall.

There is a lack of information regarding the seasonality of juvenile eel movement, particularly specific to the West Branch. Studies elsewhere have identified various temperature triggers of upstream movement by juvenile eel including, water temperatures that exceed 59 degrees Fahrenheit (°F) (Hammond and Welsh, 2009), range from 66.2 °F to 82.4 °F (Walsh and Liller, 2013), and are above 50 °F to 53.6 °F (Sullivan *et al.*, 2009). In all three studies, eel movement was associated with high discharge and, in the latter study, with a dark moon phase. These studies, along with other literature, indicate that the exact timing of upstream eel movement in a river system varies considerably.

Based on the studies mentioned above, overall juvenile eel exhibit upstream movement behavior when water temperatures are between 50 °F and 82.4 °F. Combining that temperature range with temperature information provided in the PAD (*see* Table 5.3-10; ranged from a low of 61 °F to a high of 79.5 °F between June and September), the water temperatures downstream from East Millinocket Dam would be suitable for upstream juvenile eel movement from June through September. Based on the data for June and September, water temperature also would likely be conducive to upstream movement of juvenile eel in the months of May and October. There is an overall lack of information on water temperatures in the West Branch for April and November. From December through March water temperatures are likely too cold for significant juvenile eel movement to occur.

The Penobscot River hydropower projects equipped with upstream eel passage that are situated lower in the Penobscot River system operate the ladders from June through August. East Millinocket Dam, however, is situated farther up in the river system, on the West Branch. Because of this geography, the migratory period for eels in the West Branch may extend later than it does in the lower Penobscot River.

Given that: (1) the range of temperatures across which eel could be triggered to migrate upstream occur from June through September with May and October being marginal; (2) the possibility that eel migration would extend later higher in the Penobscot Basin at the West Branch than in the lower portion of the basin; (3) the uncertainty around the triggers and timing of upstream eel migration, including the lack of data specific to the West Branch; and (4) there is a need to understand eel migration and passage at East Millinocket Dam, we recommend that GLHA sample juvenile eel at the East Millinocket Dam from May through October. This sampling season would likely capture the majority of upstream juvenile eel movement in the West Branch, without the expense of requiring GLHA to sample in the months when upstream eel migration is least likely (i.e., from November through April) [section 5.9(b)(7)].

*Sampling Methodology*

With regard to specific methodologies to sample juvenile eel in the West Branch, GLHA proposes night visual surveys, night electrofishing, and an eDNA pilot study. FWS and Maine DMR recommend visual surveys, eel pots, and trap/passage structures. All of the identified approaches are generally accepted methods for sampling juvenile eel. Because of what may be a low number of eels in the West Branch, a combination of survey types would best ensure observing eels.

Typically, visual surveys would occur during daylight hours. While eels may move during the day, they are most likely to move during a freshet at night. Thus, daytime visual surveys may be less efficient than nighttime surveys at observing eel moving upriver [section 5.9(b)(6)]. In its PSP comments, filed on February 18, 2022,

FWS states that using spotlights and binoculars for nighttime eel surveys, are ineffective techniques. However, nighttime visual surveys, of the type proposed by GLHA, have been used at six projects on the Penobscot River (i.e., Milford, Orono, Stillwater, West Enfield, Mattaceunk, and Medway), as well as other rivers in Maine in recent years to identify the need for, and location of, upstream eel passage structures, some of which now pass thousands of juvenile eels annually. Therefore, we recommend GLHA sample juvenile eel at the East Millinocket Dam using visual nighttime surveys, conducted once per week during the upstream migratory season from May 1 through October 31.

FWS and Maine DMR recommend the use of baited eel pots to sample juvenile eel at the projects. In its PSP comments filed February 22, 2022, Maine DMR states that it currently conducts a fishery independent life cycle survey of glass, yellow, and silver eels annually (Atlantic States Marine Fisheries Commission, 2021) using a ramp and pot capture system for glass and yellow eels, and a pot only approach for yellow eels in West Harbor Pond. Baited eel pots are a proven sampling technique for juvenile eel, especially in non-riverine systems. Because West Harbor Pond is a pond situated close to the ocean, the example may not be transferrable to the West Branch, where eel density has been observed to be low. Therefore, we do not recommend baited eel pots for sampling eel at the East Millinocket Development.

Nighttime boat electrofishing is a sampling technique, when coupled with nighttime visual surveys, that is likely to be effective at not only capturing juvenile eels in the East Millinocket tailrace, but also obtaining information on juvenile eel size and the seasonality of eel movement in the West Branch [section 5.9(b)(6)].[17] Therefore, we recommend nighttime boat electrofishing, as proposed by GLHA, to sample eels at the East Millinocket Development. However, electrofishing for one night in June and one night in August, as proposed by GLHA, is insufficient to provide useful information on migration trends [section 5.9(b)(6)]. Instead, we recommend that nighttime boat electrofishing for eel in the East Millinocket tailwaters occur once per month during the potential migratory season, as identified above (May through October) to aid in documenting the presence of eel at the site.

FWS and Maine DMR recommend a trap/passage collection system be employed to sample eel at the Projects partly to obtain information for a site-evaluation for permanent upstream eel passage structures at the Projects. As stated above, we do not recommend eel sampling and siting evaluations for upstream eel passage structures at the

[17] Boat electrofishing was recently used by the Georgia Power Company to sample eel downstream from Lloyd Shoals Dam (part of the Lloyd Shoals Project No. 2336) on the Ocmulgee River in Georgia. The study found that sampling at night using boat electrofishing was more effective at capturing eels than baited eel pots set just downstream from Lloyd Shoals Dam.

five dams upstream of East Millinocket Dam because of the overall low abundance of eel in the West Branch [sections 5.9(b)(6) and 5.9(b)(7)]. However, trap/passage devices can be effective eel collection tools and East Millinocket Dam is likely to need to site permanent eel passage structures. Therefore, we recommend that the Upstream American Eel Passage Assessment Study include a trap/passage device downstream from East Millinocket Dam.

Finally, GLHA proposes a pilot eDNA study to determine if such a technique is feasible to assess the presence and relative distribution of eels in the West Branch. Chin *et al.* (2021) assessed the viability of eDNA as a quantitative tool to assess the presence and relative abundance of eel in the Bronx River, New York, and the authors found a strong positive association between eel eDNA concentration and numerical density. However, the positive relationship they found cannot be generalized to other river systems without further study. The technique would first need to be validated for the Penobscot River Basin.

GLHA's proposed pilot eDNA study would involve collecting eDNA samples from six sites in the Penobscot River Basin (from June to August), including (a) the West Branch downstream from the East Millinocket Development and downstream from the Medway Project, (b) the East Branch of the Penobscot River at a point about 1.5 miles upstream of the confluence, and (c) the mainstem Penobscot River downstream from the Mattaceunk, West Enfield, and Milford Dams. Specific locations would be determined in consultation with the resource agencies. To assess the potential association between eDNA concentration and numerical abundance, GLHA would use a single methodology[18] to collect a standardized sample of eels to assess the relative abundance of eels at each site at the time of eDNA collection. This sampling approach is an acceptable, relatively low-cost approach to determine the presence and relative abundance of eel at the East Millinocket Development [sections 5.9(b)(6) and 5.9(b)(7)]. If a positive association between eDNA concentration and relative abundance of eels in the lower Penobscot River is established, GLHA could consult with the resource agencies on the need for additional eDNA monitoring, or whether a different type of sampling is needed to estimate the spatial distribution and relative abundance of eel elsewhere within the Penobscot Mills Project area. For these reasons, we recommend GLHA's proposed study include the eDNA pilot study for eels.

[18] Depending on permitting, GLHA would use either a fixed distance electrofishing sample (e.g., 30-meter shoreline transect), or a series of eel pots deployed at each site for a fixed duration (e.g., 96-hour).

**Study 19. Desktop Downstream Eel Passage Route and Survival Study**

Applicant's Proposed Study

GLHA proposes to conduct a Desktop Downstream Eel Passage Route and Survival Study. The desktop approach would use: (1) development-specific information; (2) empirical entrainment survival data collected at hydropower projects throughout the United States; and (3) FWS's Turbine Blade Strike Analysis tool (FWS, 2020). The goal of GLHA's study would be to describe the potential effects of the Projects on out-migrating adult eel through: (1) describing the physical and operational characteristics of each of the Projects' developments; (2) calculating approach velocities at the intake for each of the Projects' powerhouses; (3) compiling and summarizing available passage survival data and comparing facility characteristics to those for each of the Projects' powerhouses; and (4) generating an estimate of cumulative survival. GLHA states that this approach represents an appropriate initial step understanding routing possibilities and passage mortality rates for the projects under current operations.

Comments on the Study

In its comments on the RSP, FWS reiterates its recommendation that GLHA conduct the Downstream Eel Passage Assessment requested in its letters filed on October 7, 2021, and February 2, 2022. FWS and Maine DMR[19] request a field evaluation to quantify the effect of downstream passage on adult eels passing through the Projects. The goals of the agencies' study are to determine the effects of the Projects on the outmigration of adult eels in the West Branch. The primary objectives of the requested study are to: (1) quantify the movement rates of eels passing via various routes at the projects; (2) quantify the relative proportion of eels passing each potential emigration route at the Projects during varying operational conditions; and (3) evaluate instantaneous and latent mortality and injury of eels passed via each potential route. The agencies' requested study would consist of two separate efforts that would involve a comprehensive radio- and PIT-tag study to assess routes of passage at the developments and a balloon-tag study to assess mortality/injury at the developments.

Discussion and Staff's Recommendations

American eels inhabit West Branch riverine habitats and have been documented in fish assemblage studies from the 1980s (FERC, 1996) and more recently in 2004 (Yoder *et al*., 2008). As summarized in the PAD, fish assemblage studies conducted as part of the prior relicensing documented that eel are present in the Upper Gorge and the reaches of the West Branch downstream from McKay Station; between North Twin Dam and

[19] In a letter filed October 8, 2021, Maine DMR requests a similar study.

Quakish Lake; the East Millinocket Development tailrace; and Millinocket Stream. The more recent fish community sampling done by Yoder *et al.* (2008) found eels in the reaches of the West Branch downstream from McKay Station (two eels at Big Eddy, one eel at Abol Deadwater, one eel at Debsconeag Falls), in the vicinity of Shad Pond (six eels), and in Millinocket Stream (six eels). Eels that migrate through Project waters could be susceptible to impingement on the Projects' trashracks or entrainment through the Projects' turbines during periods of operation. This could result in delay, injury, or mortality during emigration.

To date, no directed studies of eel entrainment or mortality have been conducted at the Projects. However, eel passage has been studied at the Medway Project, which is located 0.8 mile downstream from East Millinocket Dam. Between 2004 and 2015, 88 eels were observed using the Medway upstream eel passage ramp. Moreover, the Medway passage plan required surveys to determine if an adequate number of migrating adult eels could be trapped at a location upstream of Medway[20] for use in downstream passage effectiveness studies. Catches of adult eel were low, totaling two in 2004, three in 2005, one in 2006, six in 2012, and two in 2013. The result of these efforts documented few adult eels in the West Branch.

While there is a need to address information gaps where it concerns the effects of the Projects on eel survival and passage in the West Branch, it is also important to consider the level of effort involved in studying the effects of the Projects on out-migrating eels. For FWS's and Maine DMR's requested study, about 900 adult, silver-phase, eels would be needed for the route selection component of the study.[21] The agencies did not provide an estimate for the balloon-tagging component of the study, but GLHA provides a preliminary estimate of 375 eels (50 test and 25 control eels per development at each of the five developments). As noted above, efforts to collect active silver-phase eels in the West Branch were not successful and the likelihood of doing so now, within the two study seasons afforded by the ILP regulations, is not realistic [section 5.9(b)(6)]. With regard to using out-of-basin eels as a surrogate, GLHA indicates that out-of-basin eels were used at Medway and at projects on the lower Penobscot River, where sample sizes were limited to 50 eels. Assuming the use of out-

[20] The locations included Millinocket Stream, about 8 miles upstream of its confluence with the West Branch; the West Branch between the Medway Project and the confluence with Millinocket Stream, riverine habitats within Nollesemic and Schoodic Streams, and the lacustrine portion of the Dolby and Millinocket impoundments. Sampling involved a rigid weir, fyke netting, boat electrofishing, trap netting, and eel pots for a 3-night period in mid-August.

[21] The estimate of 900 eels is derived as follows: 150 live test eels per development x five developments = 750 individuals; 75 control eels (25 dead and 50 live) per project x 2 projects = 150 individuals.

of-basin eels at the numbers recommended by the agencies, GLHA estimates that the agencies' requested study could cost $500,000 for a single season; FWS and Maine DMR estimate the cost of their request study to be $100,000 per year for the route selection component and $50-$75,000 for the injury/mortality component.

GLHA's proposed desktop approach would provide: (1) an understanding of the potential downstream passage routes and associated mortality rates for each of the Projects' developments; and (2) a reasonable estimate of entrainment and turbine survival of eels passing through the Projects. This approach would ensure that appropriate data is collected in a more cost-effective manner than requiring the agencies recommended field evaluation ($250,000 to $500,00) to quantify the effects of the Projects on downstream migrating eel in the West Branch [section 5.9(b)(7)]. Therefore, we do not recommend that GLHA be required to conduct FWS's and Maine DMR's requested Downstream Eel Passage Assessment.

**Study 25. Terrestrial, Wildlife, and Botanical Resources Study**

Requested Study

FWS requests a Terrestrial, Wildlife, and Botanical Resources Study. The goals of FWS's requested study include: (1) characterizing and describing the terrestrial, wildlife, and botanical resources that are currently representative of upland habitats within, and adjacent to, the Projects' boundaries; and (2) comparing baseline data collected during the last relicensing proceeding with current conditions of the terrestrial, wildlife, and botanical resources at the Projects. The specific objectives of the field study are to: (1) survey and inventory overall existing upland wildlife habitats; (2) document the occurrence of wildlife sightings during the course of the surveys; (3) survey and inventory vegetation cover classes and land use; (4) survey and evaluate the presence of targeted rare threatened or endangered species or associated habitats, especially of the northern long-eared bat (NLEB) and Canada lynx; (5) survey and inventory the nature and extent of upland invasive and exotic vegetation species; and (6) compare the current species diversity and distribution with the species diversity and distribution collected during the last licensing proceeding.

FWS's requested study would include a literature review to collect information needed to develop vegetation type maps. FWS requests that during field data collection, biologists conduct surveys of bald eagle nests, feeding concentrations, and roosting sites using standard aerial methodology from state and federal wildlife agencies, including photographs and georeferencing. FWS also requests that aerial nest surveys be conducted annually within a half mile of the shoreline of wetlands, rivers, streams, and beaver flowages in April of 2022 and 2023. The study report would include: (1) maps, tables, and summaries of the information above; (2) an assessment of project effects (operations, maintenance activities, potential future recreational amenities, etc.) on

terrestrial habitat, wildlife, and habitat connectivity at the Projects; and (3) recommendations for any necessary vegetation, habitat type, or wildlife protection and/or invasive species control measures, including riparian buffer restoration and protection of key nest and roost trees for bald eagles.

FWS states that without knowing what terrestrial resources currently exist and what wildlife occurs in the project area, or what types of land management and/or maintenance activities GLHA routinely undertakes, it is unable to determine if effects are currently occurring, or if they may occur under any new conditions that could be imposed in a new license.

Comments on the Study

In the RSP, GLHA does not propose to conduct the Terrestrial, Wildlife, and Botanical Resources Study requested by FWS. GLHA states that changes in upland communities over time (i.e., since the previous relicensing) are natural occurrences and/or likely the result of factors unrelated to the Projects' operations. GLHA notes that timber harvesting within the Projects' boundaries is limited to portions of the Wildlife Management Area surrounding the West Branch from Stone Dam to Shad Pond and is performed in accordance with the wildlife protection and enhancement measures defined in the Commission-approved Back Channel Wildlife Management Plan,[22,23] as well as applicable timber harvesting regulations. GLHA also states that it is not proposing modifications to the Projects, at this time, and a Canada lynx study would be premature. Should modifications be required by any new licenses, which could potentially affect Canada lynx (e.g., the development of upland recreational facilities within designated critical habitat), GLHA would consult with FWS at that time to determine the necessary measures to avoid or minimize effects to the species. GLHA also proposes to implement protection measures for NLEB in the event that GLHA proposed, or Commission-required activities could affect potential habitat for the species as an alternative to conducting acoustic surveys.

In lieu of performing invasive plant species surveys at the Projects, GLHA proposes to develop an Invasive Plant Species Management Plan that would be filed with the Final License Application and implemented pursuant to any new licenses. The plan would describe the measures to avoid the introduction or spread of invasive plant species at the Projects during construction or maintenance activities. Similarly, in lieu of

[22] Back Channel Wildlife Management Plan FERC Project No. 2458-Penobscott Mills Article 412. Filed April 21, 1997. Document Accession number: 19970428-0243.

[23] Penobscot Mills (FERC Project No. 2458), Article 412, Supplement to the Back Channel Wildlife Management Plan. Filed January 14, 1998. Document Accession number: 19980120-0258.

performing an aerial bald eagle survey to document bald eagle nests, feeding concentrations, and roosting sites, GLHA proposes to implement protective measures that would be taken during project activities (e.g., tree clearing or construction) that could affect bald eagles over the term of any new licenses.

Reply Comments

In comments on the RSP, FWS reiterates its original request for a Terrestrial, Wildlife, and Botanical Resources Study. In comments on the PSP, FWS notes that the Projects' areas contain habitat suitable for the federally listed NLEB and may contain habitat suitable for the federally threatened Canada lynx and its designated critical habitat. FWS states that, while GLHA maintains that it is not proposing any new construction, changes to current land management practices, or new land management activities as part of this licensing proceeding, the PAD provides incomplete or outdated descriptions of terrestrial resources and no descriptions of the types of land management practices that GLHA currently employs.

Discussion and Staff's Recommendations

FWS's requested Terrestrial, Wildlife, and Botanical Resources Study is very broad and would entail substantial effort and costs to complete extensive surveys and field inventories [section 5.9(b)(7)].[24] On the other hand, GLHA provides little information on its current terrestrial land management activities and any potential effects on terrestrial resources, including federally listed species, in the PAD. Applicants should provide information adequate to describe the current environmental baseline[25] on terrestrial, wildlife, and botanical resources in order for staff to assess the effects of continuing to operate the Projects [section 5.9(b)(4)]. The information is also needed for Commission staff's assessment of project effects on federally listed species. Therefore, as discussed below, we recommend that GLHA conduct a modified version of FWS's requested study.

GLHA proposes other studies at the Projects (e.g., Furbearer, Wood Turtle, Marsh Bird Surveys, and the Riparian and Littoral Habitat Studies) that would provide some wildlife and habitat data that could be included in this study. GLHA's proposed studies, however, do not cover all areas in the project boundaries that are actively managed or

[24] Inventories document and identify all species in a given area.

[25] The Commission's information needs for defining current environmental baseline conditions for environmental analysis in relicense cases was affirmed in American Rivers v. FERC, 187 F.3d 1007, amended and rehearing denied, 201 F.3d 1186 (9th Cir., 1999); Conservation Law Foundation v. FERC, 216 F.3d 41 (D. C. Cir. 2000).

affected by project operation. In order to evaluate the various types of terrestrial habitat present in the project boundaries, particularly habitat available to federally listed species or influenced by invasive species, we recommend that GLHA prepare a map of existing terrestrial cover types in the Projects' boundaries and otherwise affected by the Projects' operations. This map can be compiled from the other relevant studies, other maps, aerial photography, and, as necessary, field verification. To facilitate stakeholder review of the environmental baseline for terrestrial resources, the information from these studies should be consolidated in the Terrestrial, Wildlife, and Botanical Resources Study Report, and be filed with the ISR.

In the RSP, GHLA states that it anticipates development of an Invasive Plant Species Management Plan. However, without information on the occurrences of invasive species at the Projects, it would be difficult for GLHA to develop or, staff to evaluate, the proposal to address issues associated with invasive species. Therefore, we recommend that GLHA conduct terrestrial field surveys for invasive plants in upland areas: (1) within the Projects' boundaries; (2) that are routinely or occasionally managed or affected by project operations or maintenance (e.g., project facilities, recreation facilities, transmission lines, and timber management); and (3) where current information is not available, or would not be collected during other proposed studies.

The PAD states that the Projects' areas contain suitable habitat for NLEB and may contain habitat suitable for Canada lynx and its designated critical habitat. While we do not recommend conducting targeted surveys for these mobile, elusive species, we do recommend a desktop evaluation followed by field verification, if necessary, to determine if their associated habitats are present within the Projects' boundaries, or are affected by the Projects' operations and maintenance activities. With regard to the Canada lynx, GLHA would identify habitat containing the primary constituent elements (PCE) necessary to support this species' life-history functions. For Canada lynx, the PCEs are the essential features of the boreal forest types that provide prey, reproduction and denning habitat, and snow conditions that give lynx a competitive advantage over other hare predators.[26] With regard to the NLEB, GLHA would identify any summer roosting habitat and hibernacula at the Projects. Because the above information would be necessary to complete our analysis of federally listed species [section 5.9(b)(4)], GLHA should provide information about the occurrence of these PCEs for Canada lynx and habitat for NLEB at the Projects that would be affected by operation, maintenance, construction, and/or project-related recreation activities.

The 2,300-acre Wildlife Management Area surrounding the West Branch is subject to a wildlife management plan developed to enhance habitat diversity and

[26] 50 CFR Part 17 Vol. 79, No. 177 September 12, 2014.

increase habitat value for wildlife.[27] GLHA has monitored wildlife management and timber harvesting in this area for the past 20 years, and reported on these activities every 5 years, most recently in 2018.[28] Current information on forest composition, age, understory condition, harvesting schedules for the sections that are actively managed, and wildlife presence from wildlife monitoring could be included in the Terrestrial, Wildlife, and Botanical Resources Study Report. Because current information is available for terrestrial and wildlife resources in areas of the Wildlife Management Area, which are actively managed, the level of effort to assess current resource in these areas should not be extensive [section 5.9(b)(7)].

We do not recommend that GLHA perform aerial bald eagle surveys to document bald eagle nests, feeding concentrations, and roosting sites [section 5.9(b)(5)]. GLHA is not currently proposing any new construction, and forest management is limited to the Wildlife Management Area where GLHA implements wildlife protection and enhancement measures in accordance with the Wildlife Management Plan, as well as applicable timber harvesting regulations. While we are not recommending FWS's request for a survey, we do recommend that any eagle roosting or nesting trees, either previously documented or observed during the surveys, be recorded and georeferenced.

In summary, we recommend a modified version of FWS's requested study. For the first phase of the study, we recommend that GLHA create vegetation habitat maps and calculate the percentage of each vegetation type present in the project area. For the second phase, we recommend that GLHA conduct field surveys to verify vegetative cover types, and document wildlife habitat and occurrence, and invasive plant species in the Projects' areas. The field surveys should be limited to upland areas within the Projects boundaries that are actively managed or affected by the Projects' operations or maintenance activities, and where current information is not available, or would not be collected during other proposed studies. Finally, in order to facilitate the review and analysis of the report by stakeholders, we recommend that the study report include, as generally requested by FWS: (1) maps, tables, and summaries of the information above; (2) an assessment of the Projects effects (operations, maintenance activities, potential future recreational amenities, etc.) on terrestrial habitat, wildlife, and habitat connectivity at the Projects; and (3) identification of potential vegetation, habitat, or wildlife protection and/or invasive species control measures.

[27] Pursuant to Article 412 of the Penobscot Mills Project current license.

[28] GLHA Report on Activities in the Back Wildlife Management Area. Document Accession number: 20180212-5221. Filed February 12, 2018.

**Study 26. Wood Turtle Habitat and Presence Study**

Applicant's Proposed Study

GLHA proposes to conduct a Wood Turtle Habitat and Presence Study (Wood Turtle Study) using a phased approach and in collaboration with Maine DIFW. The goals and objectives of the study are to identify suitable wood turtle habitat in the Projects' areas, determine the presence of wood turtles in the Projects' areas, and, if found, determine whether project operations negatively affect wood turtles. Phase 1 of the study would be performed in 2022 and consists of: (1) a review and evaluation of information provided by Maine DIFW; (2) a desktop analysis of wood turtle habitat; and (3) a review of operations data for the Projects. Phase 1 activities would support the identification of targeted field surveys to be performed during Phase 2 activities. Phase 2 of the study would be performed in 2023, and consists of the targeted field surveys, if deemed necessary based on the results of Phase 1 activities. If performed, the targeted field surveys would be performed in consultation with Maine DIFW.

Comments on Study

In its comments on the RSP, Maine DIFW supports GLHA's proposed phased approach for the wood turtle study. However, given the size and remoteness of the Projects' areas, Maine DIFW recommends that GLHA work with Maine DIFW to ensure that the final field study methodology and objectives are mutually agreed-upon prior to any Phase 1 (and Phase 2, if necessary) field work.

Discussion and Staff's Recommendation

Wood turtles are listed as a Tier 1 Species of Special Concern in Maine and designated as an "at risk species" by FWS currently under consideration for federal listing under the Endangered Species Act. Maine DIFW indicates that wood turtles are present in the West Branch upstream of the Ripogenus Project area, and likely occur in other areas in the vicinity of the Projects based on wood turtle habitat evaluations and surveys in the immediate vicinity of the Projects. Wood turtle nesting and overwintering habitat in downstream riverine reaches may be affected by fluctuating water levels resulting from operation of the Projects.

GLHA's proposed Wood Turtle Study is consistent with Maine DIFW's requested study. GLHA states that if the Phase 2 targeted field surveys are performed, they would be done in consultation with Maine DIFW. We recommend that GLHA also consult with Maine DIFW on the field study methodology prior to proceeding with any proposed Phase 1 reconnaissance surveys, and Phase 2 targeted surveys (if needed) [section 5.9(b)(6)]. However, we do not require that the study methodology and objectives be mutually agreed upon, because the potential exists for mutual agreement to not be

reached, which could result in the loss of study season. Rather, the ISR should document the consultation and explain any disagreements along with GLHA's basis for choosing its study methodology and objectives over Maine DFW's.

**Study 27. Riparian and Littoral Habitat Assessment Study**

Applicant's Proposed Study

GLHA proposes to conduct a Riparian and Littoral Habitat Assessment to: (1) identify and characterize riparian and littoral habitat and quantify the exposed area within the historical fluctuation zones of the Projects' storage impoundments; (2) identify and characterize the existing wetlands within 200 feet of the storage impoundments' shorelines; and (3) document observations of wildlife and invasive aquatic plant species within the Projects' boundaries. The study would use historical operations data to identify the fluctuation zones for the Projects' storage impoundments and quantify the exposed area in the fluctuation zones.

Comments on the Study

In its comments on the RSP, Maine DIFW states that the goal of its requested and related Exposed Aquatic Habitat Assessment is to quantify the total area of exposed aquatic substrate of all waterbodies composing the projects. The requested assessment would determine the amount of exposed substrate, relative to the full pond elevation of each waterbody, under (1) 10-year average annual drawdown for each waterbody; (2) low-water years for each waterbody, using 2021 water levels; and (3) under the maximum allowable drawdown for each waterbody.

Maine DIFW also requested that GLHA conduct a quantitative assessment of exposed substrates in the downstream riverine reaches, including the West Branch downstream from Stone Dam and Millinocket Stream. Maine DIFW acknowledges that GLHA plans to collect the related information as part of other studies (e.g., Historical Operations Data Assessment, Water Quality Study, Instream Flow and Habitat Assessment of the West Branch Downstream of Stone Dam Study, and Wood Turtle Study), but, for ease of review, requests that it be included in the Riparian and Littoral Habitat Assessment.

Discussion and Staff's Recommendation

GLHA's proposed Riparian and Littoral Habitat Assessment Study encompasses most aspects of Maine DIFW's requested study. Three requested components that were not adopted as part of the study are discussed individually below.

With regard to including low water year or maximum allowable drawdown scenarios, these scenarios may result in different conditions in the storage impoundments, with the result that more littoral area of the impoundments is exposed than with the 10-year average annual drawdown scenario [sections 5.9(b)(4) and 5.9(b)(6)] and the level of effort to include them would be minimal [section 5.9(b)(7)]. Therefore, we recommend that they be included in the list of drawdown conditions to be evaluated. Therefore, we recommend that GLHA assess exposed aquatic substrate/habitat for the low water year (e.g., 2021) and maximum allowable drawdown scenarios as part of the Riparian and Littoral Habitat Assessment.

With regard to the riverine habitats in the Projects' areas, GLHA intends to collect information to evaluate exposed substrates and habitat in the riverine reaches as part of other studies. While not part of this study, including the collected information on riverine aquatic habitats from the other studies in the Riparian and Littoral Habitat Assessment Report would be a low-cost way to facilitate review of all of the results pertaining to exposed aquatic habitat that result from operation of the Projects [section 5.9(b)(7)]. Therefore, we recommend that GLHA incorporate the information collected from the other studies, related to exposed aquatic substrates and habitats, in the report for the Riparian and Littoral Habitat Assessment.

Finally, Maine DIFW requests that the exposed habitat assessment encompass all waterbodies composing the projects, including the Millinocket, Dolby, and East Millinocket impoundments. However, these developments are operated essentially as run-of-river facilities, where there are no drawdowns and water level fluctuations remain relatively stable. The amount of exposed aquatic substrate/habitat, due to drop in water levels, is, therefore, negligible in these impoundments and a study of exposed areas is unwarranted [sections 5.9(b)(5) and 5.9(b)(7)]. Therefore, we do not recommend GLHA include the Millinocket, Dolby, and East Millinocket Developments in the Riparian and Littoral Habitat Assessment Study

**Study 29. Furbearer Survey Study**

Applicant's Proposed Study

GLHA proposes to conduct a Furbearer Study to collect baseline data on muskrats and beavers in the Ripogenus Project boundary. The study would enable assessment of potential project-related effects on furbearers. The objectives of the study are to: (1) obtain baseline distribution and habitat presence/absence data and map occurrences of muskrats and beavers within the Ripogenus Project boundary; and (2) describe the

distribution and relative abundance of muskrat houses, muskrat push-ups[29] and beaver lodges[30] in various habitat types within the Ripogenus Project boundary in relation to changing water levels during the seasons. Phase 1 of the study would involve a desktop analysis to identify and describe wetland habitats using the results of the Phase 1 activities of the Marsh Bird Survey (Study 28). In Phase 2, GLHA would document the occurrences and locations (using GPS) of muskrat, beaver, beaver lodges, and muskrat houses and food caches observed while conducting other relicensing studies, as time allows, during field activities from spring to fall 2022.

To supplement the furbearer data collected while conducting other relicensing studies, GLHA proposes to conduct one survey of the Ripogenus impoundment shoreline via boat during the mid- to late fall period (weather permitting) for beaver lodges and muskrat houses and food caches. Perimeter and scanning searches of wetlands and waterbodies or streamside areas would be performed to look for muskrat and beaver signs. A total count of muskrat houses and food caches, muskrat push-ups, and beaver lodges observed would be tallied, and the location of each observation would be recorded.

Comments on the Study

In its comments on the RSP, Maine DIFW notes that GLHA's proposed Furbearer Study at the Ripogenus Project has been modified from Maine DIFW's original study request. Maine DIFW emphasizes that both beavers and muskrats residing in bank dens and backwaters can be difficult to detect, especially muskrats which can live in quite discrete places. Based on the experiences of Maine DIFW's regional wildlife biologists, muskrats frequently reside in bank dens that often require a high level of effort to detect, making detection by observers in a boat unlikely. Maine DIFW stresses that the level of effort necessary for this study would require observers traversing, by foot, backwaters, shallow coves, and other sites where a boat may not be able to travel.

Discussion and Staff's Recommendation

Maine DIFW oversees the management of all furbearers across the state. The 2020-2030 Furbearer Management Plan aims to maintain a healthy, abundant muskrat population in Maine. Muskrats are identified as a Priority 3 Species of Greatest Conservation Need in Maine's Wildlife Action Plan due to their cultural significance to Native American tribes and relatively recent population declines in the Northeast.

[29] Push-ups are areas where muskrats have pushed plant materials up through holes in the ice to create a platform for feeding.

[30] Lodges are well-constructed domed structures comprised of interwoven tree limbs, smaller branches, twigs, and mud.

GLHA's proposed Furbearer Study encompasses the aspects of Maine DIFW's revised study request.[31] However, based on Maine DIFW's comments on the PSP, GLHA's proposed methods for detecting furbearers in the Ripogenus impoundment area may not be sufficient to detect muskrat activity [section 5.9(b)(6)]. Therefore, we recommend that GLHA consult with the Maine DIFW regional wildlife biologists, prior to proceeding with any field surveys in which furbearer data would be collected. For example, if deemed appropriate, intensely surveying areas of likely muskrat or beaver activity, rather than scanning the entire impoundment or wetland margins, may improve the effectiveness of the study. The ISR should document the consultation and explain any disagreements along with GLHA's basis for choosing its study methodology and objectives over Maine DFW's.

**Study 31. Common Loon Management Plan Assessment**

Requested study

Maine DIFW requests a study to evaluate the Common Loon Management Plan at the Ripogenus Project. The objectives of the study are to: (1) assess the use of artificial nest rafts by loons at the Ripogenus impoundment; (2) evaluate loon nesting success under the Common Loon Management Plan; and (3) determine if project operations, particularly during low water years, are affecting loon nesting success and if new strategies need to be incorporated into the plan to minimize negative impacts to loon productivity.

Applicant's Proposed Study

In the RSP, GLHA proposes to conduct a Common Loon Management Plan Assessment. The goal of this assessment would be to summarize existing information collected over the term of the current license related to loons at the Ripogenus impoundment, including specific information on how the existing Loon Management Plan has been implemented. GLHA's proposed assessment would use a desktop approach to summarize existing information. This information would then be used to inform and develop an updated Loon Management Plan anticipated to be implemented at the Ripogenus Project over the term of any new license.

As part of the study, GLHA would compile and summarize the following information into a report: (1) the results of the 1998 and 1999 initial loon surveys performed at the Ripogenus impoundment; (2) the results of the 2000-2010 annual loon nest monitoring done at the Ripogenus impoundment, including, to the extent the

[31] Maine DIFW revised its initial Furbearer Study request in its February 22, 2022, comments on the PSP.

information is available, where the artificial nest rafts were deployed during that period; (3) the annual procedures from 2011 through 2021 used to deploy and maintain the artificial nest rafts; and (4) loon nest locations in relation to bathymetry maps and historic impoundment elevation data.

GHLA argues that the existing 10 years of monitoring data on the Ripogenus impoundment should provide sufficient information to understand nesting habitat and success, as well as evaluate the potential effects of impoundment fluctuations on common loons. GLHA asserts that there would be no significant new information, different from what was collected at the Ripogenus Project from 1998 through 2010, resulting from a new field study as requested by Maine DIFW. Additionally, GLHA states that the existing Ripogenus impoundment information, used in combination with the existing data from studies and monitoring done on other impoundments in Maine, would be sufficient to understand the potential effects of impoundment fluctuations on loons, as well as identify PM&Es at the Projects.

Reply Comments

In comments on the RSP, Ms. Kathleen Houston states that there appears to be little connection between GLHA's proposed methodology for the Common Loon Management Plan Assessment and Maine DIFW's request to determine if project operations are affecting loon nesting success, particularly during low water years, and if new strategies need to be incorporated into the management plan. She questions how summarizing past data, some of which is over 20 years old, would meet Maine DIFW's study request to evaluate loon nesting success and help determine if new strategies need to be incorporated into the Loon Management Plan, particularly under operating conditions since 2010. Ms. Houston asks how evaluating existing information on impoundment elevations would work given that the loon nest monitoring data are from before 2010 and the impoundment data available begins in 2010.

Discussion and Staff's Recommendations

In comments on the PSP, Maine DIFW requests additional information from GLHA on the existing Plan for the Design and Implementation of Artificial Nesting Structures for Common Loons, including, but not limited to: (1) how well the Plan has been adhered to; (2) annual maintenance and deployment of nesting structures; (3) the status of artificial nest rafts during periods of drawdowns; and (4) how frequently artificial nest raft locations have been adjusted during drawdown periods. GLHA's proposed study would include this information and would summarize how the plan has been implemented at the Ripogenus Project since monitoring and reporting ceased in 2010 [section 5.9(b)(6)]. GLHA states that the results of this study would be used to inform an updated plan. GLHA's study approach is consistent with Maine DIFW's

request, and Maine DIFW, in its comments on the RSP, provided no comments on GLHA's proposed study.

Regarding Ms. Houston's comment on GLHA's proposed methodology for analyzing historic data, fluctuating impoundment levels are known to affect loon nesting success. The effects can be assessed regardless of what timeframe is analyzed. GLHA proposes to evaluate the existing loon monitoring data in relation to historic impoundment elevations during the same timeframe by comparing loon nest locations to bathymetry maps and historic impoundment elevation data. Thus, the existing 10 years of loon monitoring data should provide sufficient information to assess the effects of project operation (i.e., impoundment fluctuations) on loon productivity at the Ripogenus Project. GLHA's proposed Historical Operations Data and Assessment would provide information on impoundment fluctuations under more recent and current operations. Additionally, GLHA's proposed Operations Model would provide information on how impoundment levels may change in the future under alterative operating scenarios. GLHA's approach is reasonable, and, therefore, we recommend that GLHA implement the study as proposed.

**Study 32. Recreation Study**

Applicant's Proposed Study

GLHA proposes to conduct a Recreation Study with the goal of collecting information on recreation site conditions and uses at project recreation sites at both the Ripogenus and Penobscot Mills Projects. The specific objectives of the study are to:

- Conduct an inventory of, and map, existing Commission-approved project recreation sites, including locations, facilities and amenities, general condition, ownership, and management responsibility (summer 2022);

- Evaluate recreation use at project recreation sites, including both an assessment of the amount of recreation use that each site receives and the recreation activities that occur at the site for both the summer and winter recreation seasons (May-September 2022, January-February 2023);

- Conduct user surveys at the project recreation sites to assess activities, site conditions, satisfaction with existing facilities, and recommendations regarding the sites and facilities (May 2022-February 2023); and

- Assess the accessibility and useability of select project boat launching facilities provided at the project recreation sites (i.e., Chesuncook Dam Point Boat Launch, Caribou Lake Put-In, Millinocket Lake Boat Launch, Ambajejus Lake Boat Launch, and South Twin Lake Boat Launch) over the range of drawdown

conditions under existing project operations and report on any changes that would be needed at the boat launching facilities to make them useable under the range of expected recreation season water levels (summer/early fall 2022).

Comments on the Study

In comments on the RSP, AW/AMC, the Camp Owners Associations, Maine TU, and Maine Professional Rafting Outfitters (MEPRO) request that the scope of the recreation study be expanded to include all formal and informal recreation sites, as well as those non-project recreation sites located near and adjacent to the Projects. MEPRO also requests that the study consider both public and commercial recreation use. Maine Bureau of Parks and Lands (Maine BPL) recommends that the Umbazooksus West Boat Launch and the Graveyard Point Boat Launch be added to GLHA's proposed Recreation Survey, noting that most campers using the Chesuncook Lake remote campsites launch and/or take-out from these sites.

Maine BPL, AW/AMC, the Camp Owners Associations, and Maine TU request that the study methodology be broadened to also include an online survey; allow for more data to be collected via direct mail surveying; collect input from a stakeholder working group; and conduct interviews with organizational representatives from user groups, representatives of camp owners, and other recreation-related interests, such as outfitters. The Camp Owners Associations request direct mail surveys to camp owners on Ripogenus, Caribou, and Chesuncook Lakes.

The Camp Owners Associations and Maine BPL request that the survey instrument be modified to capture recreation user opinions regarding lake levels at the Ripogenus Project.

The Camp Owners Associations and Maine DIFW provide comments regarding the methodology for the proposed recreation facility inventories, spot counts, and other data that would be collected as part of the Recreation Study. The Camp Owners Associations request that data from site inventories and spot counts be compiled by lake. The Camp Owners Associations also requests that the facility assessments include information about informal recreation sites, including distances from fire pits to the shoreline, and that inventories of boat launches provide an assessment of the launch's surface condition. Maine DIFW requests that GLHA identify the fishing sites used by anglers during spot checks. Maine DIFW also requests that GLHA include an analysis of daily whitewater registrations by weekday for each month from May through September.

Reply Comments

In the RSP, GLHA did not adopt the recommendation of AW/AMC, the Camp Owners Associations, Maine TU, and MEPRO to expand the scope of the study to

include both project and non-project recreation sites. GLHA states that the proposal is overly expansive in both geographic and regulatory scope. Instead, GLHA proposes to conduct a recreation study for the facilities and recreational opportunities over which GLHA has direct management. The full list of sites included in the survey would be developed in consultation with Maine DIFW and Maine BPL.

In its reply comments on the RSP, GLHA clarifies that the proposed study plan includes an online version of the recreation user survey. GLHA intends to deploy survey boxes at each of the project recreation sites which display a QR code that allows access to an online version of the recreation user survey. Further, GLHA plans to work with Maine BPL to install additional survey boxes at the locations indicated by Maine BPL that are primarily used to access the remote campsites on the Ripogenus impoundment.

Discussion and Staff's Recommendations

*Online Survey*

Given the extensive and remote nature of the Projects' areas, conducting surveys at all formal and informal recreation sites, as well as those recreation sites located near and adjacent to the Projects, as requested by AW/AMC, the Camp Owners Associations, Maine TU, and MEPRO, would be costly in terms of breadth and scope [section 5.9(b)(7)]. However, GLHA should use the Recreation Study to develop an understanding of the extent of formal and informal recreation use at the project, as well as how use differs between public and commercial recreational use. Distributing the online survey link to licensing stakeholders via a public website would provide greater survey access and potentially a more robust understanding of recreation use, needs and interest at minimal cost [section 5.9(b)(7)]. Therefore, we recommend modifying the study methodology to require that GLHA incorporate an online survey posted on the relicensing web site for the Projects and distribute a sharable link to the survey via email to all project stakeholders. We do not recommend direct mail surveys to camp owners on Ripogenus, Caribou, and Chesuncook Lakes, as requested by the Camp Owners Associations, rather we expect that the Camp Owners Associations could distribute the email link to their membership [section 5.9(b)(7)].

*Survey Locations*

Adding survey kiosks at Umbazooksus West and Graveyard Point Boat Launches, as requested by Maine BPL, would improve information about users of the remote campsites on Chesuncook Lake [section 5.9(b)(4)]. Further, expanding survey coverage to these areas is consistent with GLHA's proposal to add remote or informal access locations to the study in consultation with Maine DIFW and Maine BPL. Therefore, we recommend that the study include these sites.

*Qualitative Data Collection*

Maine BPL, AW/AMC, the Camp Owners Associations and Maine TU request that GLHA's recreation study include qualitative (interview) component to garner input from organizational representatives. Interviews or focus groups with recreation user groups and commercial outfitters are a standard practice in hydropower relicensing proceedings, and would allow for robust understanding of recreation use, needs and interests in the Projects' areas. When combined with the facility assessment reports and quantitative data collected as part of the user surveys, such qualitative information can be useful in developing a licensing proposal that meet the needs of various users [sections 5.9(b)(5) and 5.9(b)(6)]. Therefore, we recommend that GLHA add provisions for interviews or focus groups with interested individuals representing recreation user groups (e.g., whitewater boaters, anglers), commercial outfitters, and campground owner/operators. Adding this component would allow for information to be obtained on the informal and formal recreation sites at the Projects [section 5.9(b)(5)].

*Survey Questionnaire*

Maine BPL and the Camp Owners Associations both request modifications to the survey instrument to gather data on recreation user satisfaction with lake levels at the Ripogenus impoundment. Adding these questions would not be unduly burdensome and would help GLHA understand tradeoffs between maintaining lake elevations and releasing flows from the Projects [section 5.9(b)(5)]. Therefore, we recommend that GLHA modify survey question 11 to include satisfaction with the lake levels at the Projects, or otherwise address recreation user satisfaction with lake levels as requested by Maine BPL.

In order to partially address the request from Edward Spear to conduct a Creel Survey (*see* Part II – Studies Not Required) and his comments on the RSP, the Recreation Study could also be modified to collect some basic information about the recreational fishery through additional questions on the recreation user surveys. Because adding questions to the recreation survey would require less effort than conducting a separate creel survey [section 5.9(b)(7)], we recommend modifying the survey instrument to include a section of angler-specific questions (e.g., if the user is there to fish, what species are they targeting, how long did they spend fishing/length of trip, what species did they catch, how many fish were kept, approximate size, etc.).

*Facility Inventory and Spot Counts*

Maine DIFW and the Camp Owners Associations propose modifications to the methods used by GLHA for facility inventories, spot counts, and other data collection. The majority of the recommended modifications are minor, and easily accomplishable as GLHA gathers other information during the Recreation Study. We recommend adopting

Maine DIFW's request regarding informal fishing locations and whitewater registration data, as well as the Camp Owners Associations' recommendation regarding boat launch condition assessments. We also recommend that the Recreation Study Report present data by lake, where appropriate, as requested by Camp Owner's Associations. Additionally, we recommend that for any informal recreation sites evaluated, GLHA document the relative relationship between the site's amenities and the shoreline. However, we do not recommend that GLHA add all informal recreation sites to its facility inventory for the reasons specified above.

**Study 33. Whitewater Boating Assessment**

Applicant's Proposed Study

GLHA proposes a Whitewater Boating Assessment that would use existing information and the expert opinion of experienced whitewater boaters to evaluate whitewater boating access, conditions, and opportunities in four of the Projects' reaches: (1) the West Branch downstream from Ripogenus Dam to McKay Station (Upper Gorge); (2) the West Branch downstream from McKay Station to Debsconeag; (3) the West Branch downstream from Stone Dam to Shad Pond; and (4) Millinocket Stream downstream from Millinocket Lake Storage Dam. The methods specified by GLHA are consistent with a Level 1 Whitewater Flow Study as set forth by Whittaker *et al.* (2005).

As part of the study, GLHA would use existing information, internet, and literature reviews to evaluate the physical characteristics of each stream reach, the availability of boating access, and the hydrologic conditions in the stream reach, as well as the relationship between stream flow and recreational boating opportunities for a variety of watercraft. GLHA would then assess whitewater boating opportunities in each of the four study reaches using project operational data, and identify constraints on flow regimes and the resulting availability of recreational boating flows. GLHA would conduct interviews with experienced paddlers using a standardized survey aimed at providing both a quantitative and qualitative summary of whitewater boating conditions in each reach. GLHA also would evaluate demand for whitewater boating within the Projects' areas.

Comments on the Study

AW/AMC, Maine TU, and Benjamin Koehler state that a Level 1 Whitewater Flow Study may not provide a sufficient understanding of the opportunities for whitewater boating in the project reaches, and that GLHA should consider conducting a Level 2 or Level 3 study, depending on the findings of the Level 1 study. AW/AMC recommends a controlled flow release whitewater study of three reaches (Upper Gorge, Millinocket Stream, and West Branch downstream from Stone Dam) following the methods outlined in Whittaker *et al.* (2005). AW/AMC and Benjamin Koehler state that

the goals of the study should be to evaluate flows for paddlers on the four reaches, and not to solely "use existing information and paddler knowledge," as GLHA has proposed. The Camp Owners Associations, MEPRO, and 23 individuals commented on the importance of such a study.

In comments on the survey instrument, question number 9, AW/AMC prefers that, in addition to providing a yes/no response about boatability, the survey instrument include an opportunity for a narrative description of the experience, either categorized as too high, high, medium, low, too low and/or a 1-5 scale of the quality and enjoyment of the experience at the identified flow as was included in question 5. AW/AMC also requests that the survey instrument include a question that asks, "How would you prefer to find out about river flows occurring in this reach in the future?" to provide recommendations for how best to share information about whitewater boating at the Projects with the public.

AW/AMC seeks to collaborate with the licensee to help identify boaters and other paddling related organizations that can assist in identifying potential respondents, and work to increase the sample size of the study. AW/AMC requests clarification as to how surveys would be completed in person as shown on the survey instrument, and requests that GLHA seek local rafting outfitters, visit river access points, and engage directly with paddlers in-person. Additionally, AW/AMC suggests expanding the survey to include an online opportunity for respondents, as well as a kiosk style take-and-drop methodology, which would be able to reach a larger audience. AW/AMC recommends that surveys for the whitewater boating assessment be distributed, as appropriate, alongside the survey used in the Recreation Study.

Finally, AW/AMC requests that all surveys conducted be included in their entirety in the ISR, as scanned or photographed copies, in addition to any summary or aggregate data presented.

Reply Comments

In the RSP, GLHA states that additional evaluation of whitewater opportunities associated with the Projects is unnecessary, and that the AW/AMC request for a controlled flow whitewater study is unjustified. In reply comments, GLHA states that the pneumatic flashboard system at Stone Dam is not capable of consistently providing the precise or sustained flows necessary for conducting a controlled flow study within that reach.

Discussion and Staff's Recommendations

*Controlled Flow Studies*

Controlled flow studies are common for relicensing projects that have bypassed reaches. The Commission has required some licensees to follow methodology as described in Whittaker *et al.* (2005) "Flows and Recreation: A guide to studies for river professionals." Study options within the Whittaker framework include Level 1 (desk-top options), Level 2 (limited reconnaissance options), and Level 3 (intensive studies). The study options are meant to be progressive and consist of the options as phased approaches. The whitewater flow study proposed by GLHA seems to closely follow the Whittaker *et al.* (2005) methodology [section 5.9(b)(6)]. However, a Level 2 or Level 3 study may be deemed necessary as a result of the Level 1 study findings. Therefore, we recommend that GLHA conduct the Level 1 study, as proposed. The need for a Level 2 or Level 3 study would be addressed after the first study season. Following the ISR meeting, stakeholders can propose to modify the study plan, or propose new information gathering or studies [sections 5.15(d) and 5.15(e)].

Further, based on the detailed information provided by GLHA, we recognize that the flashboard system at Stone Dam is not capable of consistently providing the precise or sustained flows necessary for conducting a controlled flow study in the reach below Stone Dam. In the future, if a Level 2 or Level 3 study is warranted, use of the flashboard system for a whitewater flow study can be reevaluated.

*Modifications to the Survey Instrument*

The modifications to the survey instrument requested by AW/AMC, as stated above, are minor in scope [section 5.9(b)(7)] and would improve the quality of the results from the Whitewater Study. Therefore, we recommend a narrative description for question 9, and adding a question related to learning about river flows in the future.

*Expanding Survey Access*

GLHA proposes to interview experienced paddlers to gather quantitative and qualitative information regarding recreational boating use in the study reaches. GLHA proposes to use a standardized survey as part of the interview. The interview-based format proposed by GLHA lends itself best to in-person or tele/video interactions rather than an online survey. However, we do agree that expanding the survey to whitewater boaters familiar with the Projects would likely increase the sample size, improve the quality of the results, and create a more robust set of data [sections 5.9(b)(4) and 5.9(b)(5)]. Therefore, we recommend that GLHA include information about the survey and how to participate, and post the information at each whitewater access point. Interested paddlers could then be added to GLHA's participant list for the survey.

*Data Reporting*

AW/AMC requests that all surveys conducted be included in their entirety in the ISR. We agree that GLHA should make available scanned/photographed copies of any hard-copy surveys, in addition to the summaries provided in the final study report. If GLHA conducts the surveys as oral interviews, either in person or via telephone or video, with permission of the interview subject, GLHA should also retain recordings of the surveys and provide them, upon request, to any interested parties.

**Study 34. Aesthetics Study**

Applicant's Proposed Study

GLHA proposes to conduct an Aesthetics Study to develop baseline documentation of the scenic views, vistas, riverscapes, and other noteworthy features of the Projects from the project recreation sites and other key observation points (KOPs) frequently used by the public. Specifically, five KOPs would be documented at the Ripogenus Project (Abol Bridge, Golden Road Riverside Pull-Off, Golden Road Lakeside Pull-Off, Chesuncook Village, and Ripogenus Dam) and six KOPs would be documented at the Penobscot Mills Project (Route 157 Dolby Pond Crossing, Route 11 Crossing at Green Bridge, Route 11 Pull-Off, Golden Road/Baxter State Road Crossing at Pump Station, Stacyville Road Bridge Crossing, and Millinocket Lake Dam).

As part of the study, GLHA would collect photo and video documentation from the project recreation sites and the KOPs throughout the year. The video and photos would be dated, and flow and operational conditions at the time of the video and photo would be documented. The photos and video, along with the flow and operations data, would be included with the ISR to be filed on April 22, 2023.

Comments on the Study

In its comments on the RSP, Maine BPL requests that GLHA include an assessment of the visual impacts of drawdowns of the Ripogenus impoundment (specifically Chesuncook Lake) from a boater's perspective, rather than taking photos or video from the shoreline only.

AW/AMC states that they are concerned that the proposed study would rely exclusively on photo and video documentation and would not solicit or incorporate feedback from the public about how project operations affect visual resources. AW/AMC suggest that GLHA could use intercept or online surveys to collect data on visual resource preferences. AW/AMC and the Camp Owners Associations recommend that GLHA form an aesthetics study working group to further refine the KOPs, survey

instruments, and data collection methods. AW/AMC recommends that GLHA specify that the aesthetic evaluation would be conducted by the working group and other stakeholders on-site, rather than solely relying on a review of photographic documentation of its facilities and operations.

Discussion and Staff's Recommendations

GLHA's proposed study describes the methods for collecting images and video of existing visual resources from shoreline locations, including recreation sites and KOPs. It does not provide methods for collecting data by boat that would be representative of views of the shoreline from the water. However, Ripogenus Project operation has the potential to affect the quality of boaters' experiences by modifying visual resources. Therefore, we recommend that, in addition to the project recreation sites and identified KOPs, GLHA collect representative photos and/or video from a boater's perspective on Chesuncook Lake [section 5.9(b)(4)].

While GLHA provides a description of methods for data collection, the study plan contains no discussion of how the data would be evaluated. AW/AMC and the Camp Owners Associations recommend using a working group to develop methods for evaluating the quality of visual resources under different flows and operating characteristics, and suggest using online or in-person surveys to determine public preferences for visual resources at the Projects. While these recommendations suggest an interactive approach to evaluate the quality of visual resources, similar to GLHA, they don't provide a clear method of how to assess or interpret the findings of such surveys. Therefore, we recommend that GLHA adopt a proven methodology for visual resources assessment, such as the Bureau of Land Management's Visual Resource Management (VRM) methodology [section 5.9(b)(6)].[32] This methodology identifies visual values and develops classifications to describe the level of change from the existing conditions, allowing for informed future management decisions. VRM also recommends using an interdisciplinary team for visual resource evaluations, rather than public surveys. If VRM is used, we recommend that the evaluation team include representatives from GLHA and stakeholder groups. We recommend this approach over public surveys to collect visual preference data. The VRM analysis, combined with data collected in the Recreation Study's user survey, would be sufficient to understand preferences regarding visual resources at the Projects.

For the reasons discussed above, we recommend adopting GLHA's proposed Aesthetics Study, with the addition of data collection points on Chesuncook Lake. We

[32] This methodology is publicly available through the BLM and can be used to identify and evaluate visual values and changes in visual quality resulting from a proposal. Further information is available at https://www.blm.gov/programs/recreation/recreation-programs/visual-resource-management.

also recommend that GLHA's proposed study be modified to require use of VRM or an equivalent visual resource assessment tool. The Aesthetics Study should be conducted in consultation with Maine BPL, AW/ATC, the Camp Owners Associations, and other interested stakeholders.

**Study 37. Socioeconomic Study/Environmental Justice Analysis**

Requested Study

The Penobscot Indian Nation requests that GLHA form a Socioeconomic Working Group and conduct a Socioeconomics Study to assess existing socioeconomic conditions in the Projects' areas. The Penobscot Indian Nation's study would include an evaluation of existing conditions, including population, housing, economic development, public services, local energy production, and State statutes related to energy production, fiscal conditions, and infrastructure. The requested study would also describe current socioeconomic trends in the Projects' vicinity, and how measures implemented at the Projects may affect these trends. The Penobscot Indian Nation requests that the study be developed with extensive input from stakeholders to determine priorities for the use of resources with the potential to be affected by the project. To support this request, the Penobscot Indian Nation points to changes in the local economy as a result of the operation of the Projects and the associated paper mills, as well as the effects of the Projects on cultural, outdoor, and other economic opportunities in the region. The Atlantic Salmon Federation, AW/AMC, the Camp Owners Associations, Maine TU, Maine Professional Rafting Outfitters, and Dr. Sharon Klein filed comments supporting the Penobscot Indian Nation's requested study.

In addition to the requested socioeconomic study, the Penobscot Indian Nation requests additional information on how the project would, or would not, disproportionately affect minority and low-income people living in the region, and how factors relating to environmental justice would be considered in staff's analysis of the Projects' effects.

Comments on the Study

In response to the Penobscot Indian Nation's request, GLHA states that many of the areas of interest to the Penobscot Indian Nation would be addressed by other studies. GLHA further states that the Penobscot Indian Nation did not propose a specific methodology, and instead requests the development of a working group to identify parameters to be evaluated using existing models for socioeconomic estimation. GLHA also states that, as described in the Penobscot Indian Nation's request, there is no nexus between the Projects' continued operation and maintenance and socioeconomic issues and concerns within the project vicinity. Lastly, GLHA states that information from a socioeconomic study of non-power benefits of the river would not inform specific license

conditions; rather, GLHA points to resource-specific studies that have the potential to inform license conditions more directly.

Discussion and Staff's Recommendations

Section 5.18(b)(5)(ii) of the Commission's regulations requires that applicants for new licenses provide a description of the affected environment and an analysis of the project's proposal on socioeconomic resources in the license application. Specifically, Section 5.6(d)(3)(xi) of the Commission's regulations requires that applicants provide a general description of socioeconomic conditions in the vicinity of the project including general land use patterns (e.g., urban, agricultural, forested), population patterns, and sources of employment in the project vicinity. The information contained within the license application must reflect existing conditions, and, where relevant, should contain information about changes in conditions over the term of the last license issuance. Section 5.18(b)(5)(ii)(B) also requires that the final license application contain an analysis of how the project's proposal would affect these socioeconomic conditions.

As part of staff's environmental analysis, we intend to evaluate, to the extent feasible, the effects of relicensing the project, on socioeconomic resources. Where the effects of GLHA's proposal can be reasonably quantified (lost generation, for example), we will do so. For non-power resources, as has been our practice, our analysis will be qualitative in nature. We do not typically require studies that attempt to quantify the economic value of environmental, recreation, or cultural resources. Rather, in addition to the existing information contained in the PAD, the effects on or benefits to these resources should be reasonably identified in other studies approved as part of this SPD. The results of these studies could be used to develop PM&E measures, as necessary.

Although we do not recommend that GLHA pursue a broad socioeconomic study, as requested by the Penobscot Indian Nation, we do recommend that GLHA perform a more narrowly defined study of the Projects' potential to impact minority and low-income populations in the project vicinity. Executive Order 14008, *Tackling the Climate Crisis at Home and Abroad,*[33] and Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*,[34] as amended, require federal agencies to consider if effects on human health or the environment would be disproportionately high and adverse for environmental justice communities in the surrounding area resulting from the programs, policies, or activities of federal agencies.

[33] 86 Fed. Reg. 7,619-7,633 (January 27, 2021).

[34] 59 Fed Reg. 7,629-7,633 (February 16, 1994).

Based on staff's preliminary analysis of 2019 American Community Survey 5-year estimates, there are a number of U.S. Census block groups within 1 mile of the Projects' boundaries that exceed thresholds for minority or low-income populations, and should be considered environmental justice communities for the purpose of the Commission's NEPA analysis. Therefore, to provide additional information relevant to the analysis of the Projects' effects on environmental justice communities, we recommend that GLHA conduct an Environmental Justice Study using the methodology outlined in Appendix D. To date, this methodology has been applied in a number of Commission proceedings and is consistent with recommendations from the Environmental Protection Agency (2016). We expect that the results of the recommended analysis, combined with the socioeconomic information required to be contained within the final license application, will be sufficient to address existing information gaps regarding the effect of continuing to operate the Projects on socioeconomics and environmental justice communities. We anticipate that the study can be conducted in a single season, in consultation with the Penobscot Indian Nation and other relicensing stakeholders, with an estimated cost of $25,000. Results of the study should be included with the ISR to be filed on April 22, 2023.

## II. Studies Not Required

### Study 3. Indicators of Hydrologic Alteration Model

Requested Study

NMFS requests that GLHA conduct a study to evaluate the effects of operating the Projects on the hydrology of the West Branch and mainstream Penobscot River using the Indicators of Hydrologic Alteration (IHA) and Range of Variability Approach (RVA) methods, as described by Meridian (2004) and Richter *et al.* (1996, 1997). The goal of the study would be to evaluate the effects of the Projects on the hydrology in the West Branch, as well as the mainstem Penobscot River downstream to the Penobscot Bay estuary. The specific objective of the study is to characterize metrics of hydrologic alteration due to Project operational effects, then to identify target flows and impoundment levels using the RVA method. NMFS indicates that it is not the intent to consider "pre-project" conditions in the analysis for the relicensing; but, rather to inform future license conditions that are protective of aquatic resources in the West Branch and areas downstream from the Projects that are affected by the Projects' operations by contrasting what current conditions are with conditions that are protective of aquatic resources.

NMFS requested study would evaluate:

- seasonal effects of the Projects' operations on flows in the West Branch to the Penobscot Bay estuary that may affect Atlantic salmon and their critical habitat;
- seasonal effects of the Projects' operations on flows in the West Branch and mainstream Penobscot River to the Penobscot Bay estuary that may affect survival of sea-run fish communities, including alosines,[35] American eel, and sea lamprey;
- consistency of the Projects' operations to protect state and federal water quality standards;
- effects of the Projects on instream habitat in project-affected stream reaches, including minimum flow, peak flows, and ramping rates; and
- effects of the Projects on access to tributaries downstream from the Projects.

[35] The term alosines is a collective term for American shad, blueback herring, and alewife.

NMFS contends that the Projects' operations and maintenance activities directly and indirectly affect hydrology throughout the West Branch and the mainstem Penobscot River. In addition, NMFS states that downstream from the East Millinocket Development, various additional flows influence the magnitude and seasonality of flow in the mainstem Penobscot River, including flows from the East Branch of the Penobscot River, for which GLHA has no control. NMFS states that the results of this study would be used, in conjunction with the results of other resource-specific studies, to evaluate potential effects of the Projects and to inform licensing decisions regarding those effects.

Comments on Study

In the RSP, GLHA does not propose to conduct NMFS's requested study. GLHA states that the IHA Model was developed as a statistical tool to compare existing hydrologic conditions in a stream or river reach to unregulated hydrologic conditions. GLHA states that conducting such a comparison for the West Branch or any other reach of a highly regulated river system, such as the Penobscot River is unnecessary, asserting that "the IHA model will not provide any useful information regarding the effects of the Projects' operations on Atlantic salmon or other sea-run fish species. It will only point out how hydrologic conditions in the river basin differ from conditions that may have existed prior to construction of the Projects."

GLHA also comments that the study is not necessary because existing information is sufficient to answer the questions posed by NMFS. GLHA states that understanding how current flows in the West Branch and mainstream Penobscot River is a question that has been previously studied and evaluated, most recently during the Mattaceunk Project relicensing. Thus, GLHA argues that a study to evaluate the effects of the current flow regime from the Projects on the mainstream Penobscot River, which was determined to benefit Atlantic salmon and their critical habitat, as well as other sea-run species, is unnecessary. GLHA believes that the proposed water quality studies, instream flow studies, and the historical operations and modeling studies will be sufficient to inform Commission staff's environmental analysis and licensing decisions for the Projects.

Reply Comments

In its March 31, 2022 reply comments on the RSP, NMFS states that its original comments on the PSP stand. In its April 27, 2022 supplemental reply comments on the RSP, NMFS elaborates on its request for an IHA assessment. NMFS analyzed the 10 years of operations data that GLHA provided in the RSP, and provides an analysis of flow profiles obtained from the North Branch of the Penobscot River[36] flow gage

[36] The North Branch of the Penobscot River is a major, unregulated tributary of the West Branch that represents a natural flow regime. A run-of-river hydroelectric

compared to the flow profiles through the Projects. NMFS observes that the analysis shows very consistent, but different, flow profiles through the unregulated portions of the West Branch compared to the regulated portions of the West Branch. NMFS also provides a comparison of the Projects' operations with required minimum flow for both recreation and aquatic resources, and finds that more than the required minimum flows were released for significant periods during 2019, 2020, and 2021. Based on the analysis of the flow data, NMFS reiterates its request that the Commission require GLHA to conduct an IHA assessment to evaluate the effects of the Projects on the hydrology in the West Branch and mainstem Penobscot River downstream to the estuary.

Kathleen Houston, in her comments on the RSP, observes that the 10-years of operations data for the Projects supports the notion that GLHA releases more flow than is required by the current licenses. Ms. Houston asserts that these releases have negative effects on Ripogenus impoundments levels, as well as aquatic and recreational resources in the impoundment and river. For these reasons, Ms. Houston states that NMFS's requested study is necessary to evaluate the effect of current operations.

Discussion and Staff's Recommendation

As described in the PAD, filed on June 11, 2021, the Projects' current operations directly affect the aquatic habitat in the West Branch and mainstem Penobscot River. For example, storage of water in the Ripogenus, North Twin, and Millinocket Lake Storage impoundments affects the timing and magnitude of spring flows downstream of the impoundments. Migratory fish rely on hydrologic cues afforded by spring flows to aid them in their migration. There currently is little information in the record on the effects of the Projects' existing operations on aquatic resources in the West Branch and mainstem Penobscot River.

NMFS's requested study is one approach to address the potential effects described above. An IHA model provides a hydrologic analysis technique that considers the overall hydrological requirements of the system (Meridian, 2004). Meridian (2004) identifies a theoretical hydrologic regime that could improve biotic composition, structure, and function of the river system, and the RVA method is a tool that is used to identify flow targets based on the results of IHA analysis and the goals for meeting resource objectives.[37] There are 32 statistical metrics in the IHA model that focus on descriptors

project in the West Branch would have a flow regime similar to what is observed at the North Branch flow gage.

[37] The RVA method is a river reach- or river basin-scale approach that establishes target flows for river management according to the natural (unimpaired) hydrologic regime in a river system (Meridian, 2004). These management targets could then be used

of the streamflow regime that are considered to be important to the biological and physical integrity of a river. The 32 metrics derived in the IHA analysis can be clustered into five groups, which can then be used to assess potential environmental effects. According to Richter *et al.* (1996, 1997, and 1998), the five groups of the IHA metrics include: (1) magnitude of monthly water conditions; (2) magnitude and duration of annual extreme water conditions; (3) timing of annual extreme water conditions; (4) frequency and duration of high and low pulses; and (5) rate and frequency of change in water conditions. The RVA analysis begins with a comprehensive characterization of ecologically relevant attributes of a flow regime using the IHA model, then uses the results to develop a flow regime that would maintain or improve the aquatic community of the subject river system (Meridian, 2004).

Regarding the requirement for other projects to use an IHA/RVA analysis to develop a relicensing record, the decision for Commission staff to recommend an IHA/RVA analysis is made on a case specific basis.

Regarding this specific instance, in order to assess the effects of flow regulation conditions on project-affected river reaches, flow characteristics would need to be computed and comparison tables prepared for the inflow and outflow. However, there are no streamflow gages on the West Branch, including in the area of the Projects. Rather, generation records would be used to estimate flow through the system, and NMFS states that GLHA would need to conduct index testing to verify the accuracy of the flow estimates at the Projects. The IHA software can be run for a single hydrograph, without an unimpaired flow comparison. However, without such a comparison the RVA method cannot be applied. The alternative to using the RVA method is to compare the IHA values for existing hydrologic conditions to available information on the ecological effects of the flows observed. Using this approach, GLHA would use the existing operations information, along with GLHA's proposed Water Quality Study, Historical Operations Data Assessment, and Operations Model, to assess the Projects' effects on the hydrology in the West Branch and mainstem Penobscot River [section 5.9(b)(4)]. Therefore, we do not recommend that GLHA be required to conduct NMFS's IHA Modeling Study, but instead use information from the proposed Water Quality Study, Historical Operations Data Assessment, and Operations Model to assess how the Projects affect flow in the West Branch and mainstem Penobscot River.

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to help develop and implement river management strategies such as reservoir operations or stream diversions.

**Study 4. Ramping Rate Study**

Requested Study

Edward Spear requests a ramping study to determine the appropriate rate of flow changes below McKay Station. Mr. Spear notes that fish and aquatic communities can be vulnerable to rapid changes in flow which can disrupt the movement and feeding of, and strand, fish and aquatic insects. The objective of the requested study is to determine the appropriate rate at which flows from McKay Station can be ramped up or down to minimize the effects of project operations on aquatic resources. The study requested by Mr. Spear would result in an independent, peer-reviewed water management plan that includes an up- and down-ramping prescription that is protective of sensitive aquatic insects and salmonids.

Comments on Study

In the RSP, GLHA does not propose to conduct the requested study. GLHA states that information collected and reported from other studies, such as the Historical Operations Data Assessment, will provide information on how the Ripogenus Project is operated, including flows from McKay Station. Additionally, GHLA states that field work conducted below McKay Station, such as the Wood Turtle Study, will provide additional information on flows as they relate to aquatic organisms.

Reply Comments

In his reply comments on the RSP, Mr. Spear indicates that 10 years of hourly flow and elevation records are of no use when considering (rapid) flow change over a short timeframe. Mr. Spear states that the issue is not an evaluation of past practices, but rather of future rates of flow change that should, in his view, be limited to protect aquatic organisms under any new license. Mr. Spear states that it is difficult to imagine the Wood Turtle Study, even one preformed with scuba gear, as contributing useful ramping information.

Discussion and Staff's Recommendations

As discussed in our recommendations regarding Study 5, the Fish Stranding Study, rapid changes in flow and decreases in water surface elevations can increase the risk of fish and invertebrate stranding that can be stressful and/or lethal for aquatic organisms. As indicated by GLHA, the proposed Historical Operations Data Assessment, would provide information on how the Ripogenus Project is operated, including flows provided by McKay Station. However, it is unclear how this study would determine whether the current rate of downstream flow changes adversely affects aquatic resources or how it would determine the rate at which flows from McKay Station can be ramped up

or down to minimize the effects of project operations on aquatic resources. While the Wood Turtle Study would help to evaluate the effects of downstream flows on the wood turtle, it is unclear how that study would support evaluating whether downstream flow changes adversely affect aquatic resources such as fish and aquatic invertebrates, which may be stranded in isolated pools of water or how it would determine the rate at which flows from McKay Station can be up ramped or down to minimize the effects of project operations on aquatic resources.

In our review of the Fish Stranding Study, we recommend evaluating the range of flows under which generator trips at the McKay Station are likely to occur as a way of helping to identify specific conditions that lead to low flow excursions. Accompanying field surveys, required in the Fish Stranding Study, would evaluate fish and invertebrate stranding potential and document stranding that occurs during low flow excursions. Collectively, these results would help determine whether ramping requirements, as requested by Mr. Spear, are warranted [section 5.9(b)(7)]. Further, the results of the Fish Stranding Study would inform the development of license requirements surrounding emergency minimum flows and the rate at which downstream flows are increased or decreased if necessary [section 5.9(b)(5)].

Because the information sought by Mr. Spear would be collected as part of the recommended Fish Stranding Study, we do not recommend GLHA also conduct Mr. Spear's requested Ramping Rate Study.

**Study 11. River Temperature in West Branch and Mainstem Penobscot River Study**

Requested Study

NMFS requests that GLHA conduct a study to evaluate project effects on temperature in the West Branch and mainstream Penobscot River (River Temperature Study). Citing Mantua *et al*. (2010), NMFS asserts that the combined effect of a warming climate, along with altered stream flows due to hydropower dam operations, can negatively affect the reproductive success of salmonids. NMFS states that, currently, there is no information on the effects of operating the Projects on ambient river temperatures in the West Branch or mainstem Penobscot River. The study requested by NMFS would involve: (1) modeling the seasonal effects of the Projects' impoundments and flow modifications on the West Branch and mainstem Penobscot River water temperatures and comparing those temperatures to those that would occur if the West Branch were unmodified by dams; (2) collecting water temperature profiles in the Ripogenus and North Twin impoundments; and (3) developing an alternatives analysis to provide information on the efficacy of potential measures to address any project effects on water temperature.

Comments on Study

In the RSP, GLHA does not propose to conduct NMFS's requested study. GLHA states that, in lieu of modeling river temperatures, it is proposing a comprehensive water quality monitoring study that would include collecting: (1) water temperature profile data in all basins of the Ripogenus and North Twin impoundments, as well as the Millinocket Lake Storage impoundment; and (2) continuous water temperature data in the riverine reaches affected by project operations, including the West Branch downstream from the East Millinocket Dam. In addition, GLHA states that its proposed Operations Model can be used to simulate different operational alternatives based on various water years and operating scenarios.

Reply Comments

In its reply comments on the RSP, NMFS reiterates its original study request.

Discussion and Staff's Recommendation

The West Branch drains 24 percent of the Penobscot River basin (NMFS, 2009) and about 57 percent of the West Branch is impounded by dams (Corps, 1990). In the PAD, GLHA states that the Projects are operated to "dampen the variability and occasional extremes of seasonal precipitation." This mode of operation may modify water temperatures that could affect survival of sea-run fish in the mainstream Penobscot River, including the federally endangered Atlantic salmon and its critical habitat. As NMFS has indicated, there is currently no water temperature information for the Projects on which to base an analysis of any effects, or to inform license conditions to address such effects. However, NMFS's requested River Temperature Study is not necessary to inform future license conditions for the Projects [section 5.9(b)(5)]. GLHA is proposing to collect water temperature profile data in the Projects' impoundments, as well as continuous water temperature data in the riverine reaches affected by the Projects. This information, along with information from GLHA's proposed Historic Operations Data Assessment, can be used to evaluate the effects of project operations on water temperature in the West Branch and mainstream Penobscot River.[38] Moreover, GLHA's

[38] Flow from the East Millinocket Dam enters the Medway Project's impoundment before entering the mainstream Penobscot River at its confluence with the East Branch of the Penobscot River. The Medway Project has a small (120-acre) impoundment and the station is a run-of-river facility. Given the dam (with flashboards) is less than 21 feet in height and its retention time is small, the Medway Project likely has little, if any, effect on water temperatures in the West Branch.

proposed Operations Model can be used to simulate alternatives for future project operations that consider aquatic habitat and species needs in the river.

Regarding NMFS's request for a comparative analysis to water temperatures if the West Branch were unimpaired by dams, the Commission defines baseline during a relicensing process as the conditions that exist at the time of relicensing. Thus, studies that seek to examine a theoretical, non-project condition is not relevant to a proposed licensing action. Moreover, conducting such an analysis would essentially describe pre-project conditions, rather than provide for an assessment of the conditions that would exist with potential environmental enhancement measures. For these reasons, the requested comparative analysis would not inform the development of license conditions [section 5.9(b)(5)].

Because the potential effects on water temperature can be conducted using the information to be provided by GLHA's proposed Water Quality Study, Historic Operations Data Assessment, and Operations Model, we do not recommend that GLHA also conduct NMFS's River Temperature in the West Branch and Mainstem Penobscot River Study.

**Study 12. Future Flow and Water Temperature Scenarios/Climate Change Study**

Requested Study

NMFS requests that GLHA conduct a study to evaluate future flow and water temperature conditions in the West Branch and mainstem Penobscot River. The goal of this study is to evaluate how operation of the Projects would affect future stream flow and temperature in the rivers. NMFS's requested study would involve: (1) identifying a minimum of four future climate scenarios; (2) modeling the seasonal anticipated future effects of impoundment and flow modifications on river temperatures and flow in the West Branch and mainstem Penobscot River compared to an unimpaired river for each scenario identified in item 1; (3) identifying a range of physical and operational modifications necessary to ameliorate the effects of each climate scenario modeled; and (4) assessing how impoundment operations, access to tributaries for fish and other aquatic life, and water temperature and DO concentration in the Projects' areas would be affected by projected future flows in the river. NMFS's requested study would involve analyzing downscaled temperature and precipitation data to assess future risks,[39] which NMFS states can provide a range of likely future scenarios.

[39] Downscaling methods require a variety of input parameters and the models are highly sensitive to input data sources (Walton *et al.*, 2020). Because streamflow gaging records are not available for the West Branch, it is unclear how accurate the methods could be in predicting future operations for the Projects.

NMFS asserts that there currently is no information on how the Projects' operations would affect future stream flows and water temperature in the West Branch and mainstem Penobscot River. Moreover, NMFS states that the combined effect of a warming climate, along with altered stream flows, could directly affect the survival of Atlantic salmon and other sea-run fish in the Penobscot River Basin. NMFS suggests that the results of this study could be used to evaluate the effects of the Projects on Atlantic salmon and their critical habitat and to define the necessity and scope of potential PM&E measures.

Comments on Study

In the RSP, GLHA does not propose to conduct NMFS's requested study. GLHA states that it recognizes the importance of climate change, but indicates that the potential hydrologic changes that may occur over the course of 30- to 50-year licenses are far too unpredictable to allow for quantitative evaluation as requested. GLHA argues that it is not clear how the information obtained from the requested study would inform license conditions for the Projects. GLHA notes that weather patterns in Maine are highly variable and that operational flexibility will be vital to accommodate future annual and seasonal hydrologic variability.

Reply Comments

In its reply comments on the RSP, NMFS reiterates its original study request.

Discussion and Staff's Recommendation

Flow and temperature conditions may change over the proposed license term due to climate change. Information indicates that the climate in Maine is warming and will continue to warm, and as a consequence, precipitation type, rates, and duration will continue to change (Allan *et al.*, 2021; Fernandez *et al.*, 2020). For example, the University of Maine's Climate Change Institute reports that Northern Maine's average annual temperature has increased by 3.1 degrees Fahrenheit (°F) since 1895, and about 1.4 °F over the last 30 years (Fernandez *et al.*, 2020). Allan *et al.* (2021) project that the climate of the Northeast United States will trend towards warmer and wetter weather.

Along with a warming climate, Maine has seen changes in precipitation patterns. Fernandez *et al.* (2020) report that the average annual precipitation has increased by 5.8 inches (or 15 percent) since 1895, and the average annual snowfall for Maine has decreased by 2.3 inches (or 20 percent) over the same time period. Most of the increases in precipitation are associated with increased intensity and duration of fall storm events, and despite the increases in annual precipitation, drought events in Maine have become more severe both in duration and magnitude.

Despite the trend toward warmer and wetter conditions in Maine, there remains uncertainty in the reliability of predicting how precipitation, snowmelt, evapo-transpiration, ice out, and annual runoff patterns may change. Downscaling techniques, such as those NMFS recommends, add a level of process-based uncertainty into the models that are passed to the downscaled projections, creating even greater uncertainty. Such uncertainty would preclude the identification and development of specific alternative operational scenarios that could be considered to mitigate any potential future climate change effects [section 5.9(b)(6)]. Moreover, current guidance from the Council on Environmental Quality (2016) states that "in accordance with NEPA's rule of reason and standards for obtaining information regarding reasonably foreseeable effects on the human environment, agencies need not undertake new research or analysis of potential climate change impacts in the proposed action area but may instead summarize and incorporate by reference the relevant scientific literature."

Finally, even under a best-case scenario where flow and temperature model results could accurately predict future variability at a project scale, it is not clear how that information would better inform license conditions for the Projects than what GLHA proposes [section 5.9(b)(5)]. GLHA proposes to collect water temperature data from the Projects' impoundments and downstream reaches affected by the Projects' operations, including downstream of the East Millinocket Development, as well as summarize historic operations data for the Projects. In addition, GLHA proposes to develop an Operations Model that can be used to simulate operational alternatives based on various water year classifications (i.e., wet, normal, dry). This information should be sufficient to evaluate the Projects' effects on aquatic resources in the West Branch and mainstem Penobscot River, including Atlantic salmon and their habitat, under a wide range of flow conditions including those under droughts to those under wet periods.

For the reasons explained above, we do not recommend GLHA conduct NMFS's requested Future Flow and Water Temperature Scenarios/Climate Change Study.

**Study 16. Ripogenus Impoundment Zooplankton Study**

Requested Study

Edward Spear requests that GLHA conduct a study to evaluate the zooplankton population in the Ripogenus impoundment and its relationship to larval and juvenile rainbow smelt. Mr. Spear references the poor quality of the impoundment's zooplankton community, smelt population (a major food source for the salmon),[40] and the current

[40] Smelt are dependent on zooplankton for their food source, and favor "large" bodied prey (e.g., midges), and plankton communities can change with season and lake basin.

relatively small landlocked salmon size in the Ripogenus impoundment as the bases for his requested study. The goal of the requested study would be to determine whether or not the depressed populations of rainbow smelt and reported small size of salmon are a function of zooplankton abundance that is allegedly affected by operation of the Ripogenus Project. Mr. Spear states that the exact mechanism that leads to the depressed zooplankton and smelt populations are unknown, but he asserts that they are directly related to lake level management in the Ripogenus impoundment. Mr. Spear states that there are no existing data on the growth and abundance of smelt populations, or the zooplankton communities, in the Ripogenus impoundment to fill this data gap. Mr. Spear provides no details regarding the methodology for conducting his requested study.

Comments on Study

In the RSP, GLHA does not propose to conduct Mr. Spear's requested zooplankton study for the Ripogenus impoundment. GLHA states that Mr. Spear's argument for the requested study does not consider that landlocked salmon appear to be overpopulated in the impoundment and that populations of both fish species historically fluctuate. GLHA recognizes that rainbow smelt, which are not endemic to the West Branch, are an important food source for the landlocked salmon population that inhabits the Ripogenus impoundment, and that the volatile predator-prey relationship between the two species has been an on-going statewide concern for managing landlocked salmon fisheries for decades.[41] Moreover, GLHA notes that after years of Maine DIFW monitoring of the Chesuncook Lake fishery, Maine DIFW concluded that the depressed Ripogenus salmon fishery is due to an overabundance of landlocked salmon, which in turn has reduced the smelt forage base. Finally, GLHA notes that the phytoplankton and zooplankton studies conducted for the previous relicensing, which Mr. Spear references in his comments, were not designed to analyze the trophic food web relationships between zooplankton, smelt, and salmon, and they represent nothing more than a snapshot of the abundance and composition of the plankton community at that time and cannot serve as a stable or representative estimate of conditions in the impoundment.

Reply Comments

In his comments on the RSP, Mr. Spear argues that his requested study would provide the answers to most of the "problems" associated with the Ripogenus impoundment and downstream salmon fishery, and that the results would support the development of appropriate PM&E measures at the project for the next license term. Mr. Spear states that the origin of the smelt population is not important to the issue regarding the impoundment's smelt population. Mr. Spear states, without support, that Maine DIFW links the Ripogenus impoundment's salmon collapse to low smelt abundance,

[41] RSP at 6-18.

rather than an overpopulation of salmon in the impoundment. Mr. Spear indicates that his study request involves an inventory of the Ripogenus impoundment's phyto and zooplankton communities and smelt populations, which he states is a simple description of existing aquatic communities. He also clarifies that the requested study would involve multiple sampling events but would not be a multi-year study. Mr. Spear states that year-class fluctuations of smelt are typically between alternate years, not over a decade. Finally, Mr. Spear questions GLHA's assertion of overpopulation in the salmon population of the Ripogenus Impoundment, though he agrees that overpopulation occurs in some lakes in Maine.

In comments on the RSP, the Camp Owners Associations states that it supports Mr. Spear's contention that lake drawdowns directly and indirectly affect smelt populations in the Ripogenus impoundment.

Discussion and Staff's Recommendations

Zooplankton are small, aquatic microorganisms in the water column that include crustaceans, rotifers, open water insect larvae, and aquatic mites.[42] They are an important intermediary component of the food web, transferring energy from primary producers to the larger invertebrate predators and fish that feed on them. Larval fish assemblages are influenced by the availability and species composition of prey, as well as by habitat availability (particularly cover vegetation in shallow littoral areas where they can avoid predation). Juvenile rainbow smelt typically inhabit shoreline areas that are 6 to 18 feet in depth and relatively warm.[43] Sub-adult, or young-of-year, smelt are found in the pelagic (open water) zones of lakes. Spawning occurs primarily in tributary streams but may occur along a lake's shoreline. Rainbow smelt are zooplanktivorous at small sizes of less than 5.9 inches, consuming copepods and cladocerans (e.g., *Daphnia* and *Bosmina*), while at larger sizes, greater than 5.9 inches, their diet includes benthic crustaceans, as well as larval and small fishes (Sheppard *et al.*, 2012).

As Mr. Spear points out, impoundment level fluctuations can negatively affect aquatic communities. However, food web interactions are dynamic and regularly changing. The food web balance can be affected by a number of factors, including, in addition to lake level fluctuations, water quality, competition, and predator-prey relationships. In this instance, we have no reason to suspect that any adverse effects on zooplankton are specifically and directly related to lake level management in the

[42] *See* https://www.epa.gov/national-aquatic-resource-surveys/indicators-zooplankton, access May 3, 2022.

[43] *See* https://nas.er.usgs.gov/queries/factsheet.aspx?SpeciesID=796, accessed May 3, 2022.

Ripogenus impoundment as asserted by Mr. Spear, and Mr. Spear provided no basis to support is contention.

Moreover, and as a general matter, to assess the trophic relationships in question in order to rule out any project-related effect on zooplankton would be an extensive and expensive exercise that would likely take multiple study seasons to complete [section 5.9(b)(7)]. The limited information obtained, from one season of zooplankton sampling alone, would not be sufficient to answer the questions posed by Mr. Spear [section 5.9(b)(5)]. For these reasons, we do not recommend that GLHA be required to conduct the Ripogenus Impoundment Zooplankton Study requested by Mr. Spear.

**Study 17. 3-D Computational Flow Dynamics (CFD) Model Study**

Requested Study

FWS and Maine DMR request that GLHA conduct a 3-D Computational Fluid Dynamics (CFD) Model Study. The goal of the study would be to determine the potential hydraulic effects of the Penobscot Mills Project (i.e., East Millinocket, Dolby, Millinocket, North Twin, and Millinocket Lake Storage Developments) and the Ripogenus Project on: (1) the zone of passage for migratory fish near turbine discharges; and (2) flows and flow patterns immediately upstream of and downstream from each of the Projects' developments. Maine DMR states that this comprehensive understanding of hydraulic conditions at each powerhouse forebay is needed to create "safe, timely, and effective" upstream and downstream passage for Atlantic salmon, American shad, American eel, alewife, blueback herring, and sea lamprey on the West Branch (*see* Study Requests 22-24 below).

In their comments on GLHA's PSP, FWS and Maine DMR suggest that they would be willing to delay the requested CFD modeling until a future date. As an interim measure, FWS requested that GLHA collect headpond bathymetry data during the first study season, in anticipation of conducting the CFD modeling during the second study season. Maine DMR indicated that it would be amenable to delaying the requested modeling, provided the information from the study would be available to the Commission and stakeholders coinciding with the review of the draft license application or preliminary licensing proposal.

Comments on Study

In the RSP, GLHA does not propose to conduct FWS's and Maine DMR's requested CFD modeling study. GLHA states that the request for a CFD Model Study is equivalent to developing PM&E measures and is premature at this time. GLHA acknowledges that such an effort may be necessary at a future date. GLHA notes that the 2008 Strategic Plan for the Restoration of diadromous fishes to the Penobscot River

(Maine DMR & Maine DIFW, 2008) states that Atlantic salmon, American shad, and American eel historically used portions of the West Branch, but due to the lack of passage downstream at the time of preparation, West Branch passage of these species was not planned for the near future. There have been no new or amended restoration plans to define the timeline or strategies for sea-run fish on the West Branch. Moreover, GLHA indicates that, with the exception of American eel, sea-run fish (e.g., Atlantic salmon and American shad) do not have access to the West Branch.

Reply Comments

In its comments on the RSP, FWS, without elaboration, reiterates its request that GLHA conduct a CFD Model Study at each of the Projects' developments.

Discussion and Staff's Recommendations

The development of the requested CFD models would assist in determining potential effects of each of the project dams on hydraulic conditions for migrating fish in the West Branch and help inform fish passage designs and requirements at the projects. However, any potential fish passage measures to be implemented at the Projects would be dependent upon the schedules and effectiveness of passage enhancements at two downstream locations, including the Medway Project, which is located on the West Branch about 0.8 miles downstream from the Penobscot Mills Project's East Millinocket Development and the Mattaceunk Project No. 2520, which is located on the mainstem Penobscot River about 7 miles downstream from the confluence of the East Branch and West Branch and about 8 miles downstream of the East Millinocket Development. With the exception of upstream passage for American eel, there are currently no fish passage facilities at the Medway Project, for which the license expires in 2029. The Mattaceunk Project, for which a new license was issued on February 26, 2021, will not have improved upstream passage for alosines (via a new fishway), until 2037. Thus, the need for anadromous[44] fish passage at the Penobscot Mills Project is years in the future (and farther into the future for the further upstream Ripogenus Project). To undertake the CFD modeling exercise for anadromous fish species at this time would be premature [section 5.9(b)(5)].

With regard to American eel passage, one of the purposes of the requested CFD model study is to determine whether there are any upstream or downstream passage issues specifically associated with passage of eels at the Projects' dams. GLHA's

[44] Anadromous is a term that refers to a fish (e.g., salmon, alosines, sea lamprey) that ascend rivers from the sea to spawn.

stepwise approach would ensure that appropriate data is collected in a more cost-effective manner than requiring CFD modeling ($300,000)[45] at the onset [(section 5.9(b)(7)]. The ILP regulations contemplate the possibility of conducting additional studies, if the data collected in the first year do not meet the study objectives or indicate that further study is needed [sections 5.15(d) and 5.15(e)]. If the results of the required Upstream American Eel Passage Assessment – Presence, Distribution, and Relative Abundance of Juvenile Eel and Desktop Downstream Eel Passage Route and Survival Assessment show that passage is warranted, and more detail on hydraulic conditions for passage is needed, a specifically designed CFD Model Study could be considered after the ISR is filed.

**Study 20. Evaluation of Eel Size and Timing of Downstream Migratory Movement Study**

Requested Study

FWS and Maine DMR request that GLHA evaluate American eel size and downstream migratory movement at the Projects. The goals and objectives of the study are to understand the size and timing of downstream migrating eels, by quantifying and characterizing: (1) the size range of adult eels (silver eels) at, and moving downstream past, the Projects; and (2) the general migratory timing and presence of silver eels in the West Branch relative to environmental factors and operations of the Projects. FWS and Maine DMR state that the timing of downstream migration of silver eels is not defined for the West Branch, and there is no information about the size of the eels attempting to move downstream past the Projects. Therefore, the general effects of Project operations on eel survival to the ocean are unknown. FWS and Maine DMR state that this study would provide baseline information on river-specific downstream migration to predict when silver eels are expected to migrate downstream in the West Branch and facilitate the development of protection measures at the Projects, including changes in operation of the Projects to minimize passage risks.

The requested study would involve traditional active trapping (e.g., fyke or stow net sampling, weirs, or eel racks), or, alternatively, active and passive monitoring of migrant eels using hydroacoustic methods.[46] GLHA would need to identify at least two potential locations for sampling that would provide a route of downstream passage with a proximal bypass. The bypass would be equipped with a sampler so that fish could be concentrated/collected from the passage route and identified to species. Assuming a

[45] FWS and Maine DMR cite a cost of $50,000 for each CFD model. We assume a model would be needed for each of the projects' developments, including Ripogenus, North Twin, Millinocket, Dolby, East Millinocket, and Millinocket Lake Storage Dam.

[46] Passive monitoring would require verification of potential acoustic targets with some level of active (collection) or visual (optical or acoustic video) sampling.

combination of passive and active sampling, adult, silver eels would be assessed using methods similar to Haro *et al.* (1999), by continuously monitoring a fixed location at the Projects with hydroacoustics throughout the entire potential migratory season (mid-August through mid-December). An acoustic camera system would be operated concurrently with the acoustic monitoring to verify presence of eels and relative abundance of eel-sized hydroacoustic targets from the hydroacoustic data, as well as the sizes of the eels collected. Finally, each Projects' operations and environmental conditions would be monitored hourly, if possible, throughout the duration of the study.

Comments on the Study

In their comments on the PSP, FWS and Maine DMR reiterated their request for site-specific information on out-migrating eel size and timing, contending that the sources referenced in the PSP: (1) do not provide recent data; (2) are biased by collection methodology; and (3) are not representative of locations in the upper portion of the watershed.

In the RSP, GLHA does not propose to conduct FWS's and Maine DMR's requested downstream American Eel Passage Alternatives Study to evaluate eel size and timing of downstream migratory movement. GLHA contends that eel size and outmigration periods have been thoroughly studied in Maine rivers. GLHA argues that the results of its proposed Upstream American Eel Passage Assessment Study, coupled with: (1) the existing information on out-migration size and timing; and (2) the results of the proposed Desktop Downstream Eel Passage Route and Survival Assessment Study would provide adequate information on eel out migration. GLHA asserts that, based on expected low eel densities upstream of the Projects, actively sampling eels would be expensive and unlikely to provide an adequate sample size to obtain information on timing and population size and distribution.

Reply Comments

In its comments on the RSP, FWS, without elaboration, reiterates its request that GLHA conduct a study to evaluate American eel size and timing of downstream migratory movement.

Discussion and Staff's Recommendation

As previously stated, eel have been documented in the Projects' impoundments, but are thought to occur in limited numbers due to the Projects' location in the watershed

and the lack of eel passage at the Mattaceunk Project[47] located on the mainstream Penobscot River. Thus, operation of the Projects could affect survival of out-migrating silver eels from the West Branch.

The timing and size of out-migrating silver eels has been well studied in Maine. For example, Haro *et al*. (2003) characterizes run timing of out-migrating American eels in Maine as occurring from early September to early November, with the peak occurring during September 15 and October 15. Shepard (2015) indicates that eel out-migration in Maine occurs from August through October, with peak passage occurring in response to high river flows. In males, silvering happens at a size of about 14 to 16 inches, while silvering females are generally larger than 16 inches, and often exceed 39 inches. Based on commercial catch data from the Penobscot River tributaries, Weaver *et al*. (2021) found that out-migrating silver eels move most frequently when river discharge is greater than average. The maximum daily eel catch was observed at a water temperature of 60.8 °F. Weaver *et al*. (2021) also reported a negative relationship exists between eel catch and moon phase with catch higher during the new moon phase and decreasing towards the full moon phase.

The relatively recent information described above should be sufficient to evaluate the size and timing of out-migrating eels in the Penobscot River basin [section 5.9(b)(4)]. With the expected low density of eels, it would be very difficult and costly to acquire data significantly better than that already available [section 5.9(b)(7)].[48]

The required Upstream American Eel Passage Assessment Study, which incorporates the eDNA approach suggested by Maine DMR, if successful in its pilot year, should be sufficient to gain a better understanding of the current distribution and relative abundance of American eels upstream of the Projects. This information is currently lacking for the West Branch. GLHA's approach to addressing downstream eel migration project effects is reasonable. Given that the ILP regulations contemplate the possibility of conducting additional studies, if the data collected in the first year indicate that further study is needed [sections 5.15 (d) and 5.15(e)], the need for additional study of downstream eel migration in the West Branch can be considered after filing of the ISR. For the above reasons, we do not recommend requiring that GLHA carry out FWS's and Maine DMR's requested Evaluation of Eel Size and Timing of Downstream Migratory Movement Study.

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[47] Upstream eel passage would be installed and operational at the Mattaceunk Project by June 1, 2023. *See* accession numbers 20211119-5211 and 20210817-5102.

[48] FWS and Maine DMR estimate the cost of their requested 2-year study to be $100,000. This estimate could increase if the number of eels sampled in accordance with the requested study design were insufficient to characterize the timing and size of out-migrating eels in the West Branch.

**Study 21. Downstream American Eel Passage Alternatives Study**

Requested Study

FWS requests that GLHA conduct a Downstream American Eel Passage Alternatives Study. The goal of the study is to determine conceptual options, and expected performance, for improved downstream passage that reduces delay, increases passage efficiency, and enhances survival for downstream migrating adult eels as they attempt to pass Ripogenus Dam, and the North Twin, Millinocket Lake Storage, Millinocket, Dolby, and East Millinocket Developments.

FWS's Downstream American Eel Passage Alternatives Study would consist of: (1) reviewing existing downstream fish passage technologies that meet FWS fish passage criteria (FWS, 2019), and (2) preparing conceptual engineering designs of downstream fish passage options. The expected performance of each alternative would be included in any report developed for the study. FWS states that data derived from this study would: (1) facilitate the evaluation of various alternatives to providing downstream eel passage at the Projects; (2) inform the Commission's licensing process; and (3) contribute to the development of an administrative record to support development of protection and enhancement measures for American eel.

Comments on Studies

In the RSP, GLHA does not propose to conduct FWS's requested Downstream American Eel Passage Alternatives Study. GLHA suggests that eel occur in limited numbers in the Projects' waters due to: (1) the Projects' relative location high in the watershed; (2) the abundance of eel habitat that exists in the East Branch and mainstem Penobscot River; and (3) the lack of upstream passage at the Mattaceunk Project. GLHA reports that only a small number of eels were observed from 2004 to 2015 at the downstream Medway Project . GLHA argues that FWS's requested downstream American eel passage alternatives study equates to the development of PM&E measures, which is premature at this time.

Reply Comments

In its comments on the RSP, FWS, without elaboration, reasserts its request that GLHA conduct a Downstream American Eel Passage Alternatives Study.

Discussion and Staff's Recommendation

GLHA is required to conduct an Upstream American Eel Passage Assessment Study for the Penobscot Mills Project and a Desktop Downstream Eel Passage Route and Survival Assessment Study for the Ripogenus and Penobscot Mills Projects. These required studies would document the relative densities of juvenile eels throughout the system, as well as characterize the downstream passage availability and survivability of the existing Projects' structures and operations, which would help inform downstream eel passage needs at the Projects. Until information on the densities of eels at the Projects and the effects of existing structures, if any, on downstream passaged is obtained, we have no basis for recommending an assessment of potential downstream eel passage options and related design considerations. Following the ISR meeting, stakeholders can propose to modify the study plan, or propose new information gathering or studies [sections 5.15(d) and 5.15(e)]. Therefore, we do not recommend that GLHA be required to conduct a downstream American eel passage alternatives study during the 2022 study season.

**Studies 22 and 23. Upstream Fish Passage Alternatives Study and Downstream Fish Passage Alternatives Study**

Requested Studies

Maine DMR requests that GLHA conduct upstream and downstream fish passage alternatives studies. The goal of the Upstream Fish Passage Alternatives Study is to determine conceptual options and the expected performance for passage structures that would provide "safe, timely, and effective" upstream passage for upstream migrating fish in the West Branch. The goal of the Downstream Fish Passage Alternative Study is to determine conceptual options and the expected performance for improved downstream passage that would reduce delay, increase passage efficiency, and increase survival for downstream migrating fish in the West Branch. Maine DMR asserts that access to the historic habitat in the West Branch is important to achieving the management goals for Atlantic salmon, American shad, alewife, blueback herring, and sea lamprey, and that effective upstream and downstream passage is critical to the restoration of these species to the West Branch. Maine DMR notes that, with the exception of an upstream ladder at the North Twin Development, the Penobscot Mills Project developments and Ripogenus Dam lack upstream and downstream fish passage structures to allow fish access to upstream habitat and safely pass back downstream.

Maine DMR's upstream and downstream fish passage alternatives studies would consist of: (1) a review of existing upstream and downstream fish passage technologies that meet FWS fish passage criteria (FWS, 2019); and (2) conceptual engineering designs of upstream and downstream fish passage. Maine DMR states that the information derived from the upstream and downstream fish passage alternatives studies would: (1) facilitate an evaluation of fish passage alternatives at the Projects; (2) inform the

Commission's licensing process; and (3) contribute to the development of an administrative record to support PM&E measures for Atlantic salmon, American shad, alewife, blueback herring, and sea lamprey.

Comments on the Studies

In the RSP, GLHA does not propose to conduct Maine DMR's requested upstream and downstream fish passage alternatives studies. GLHA states that the Projects' waters are currently managed by Maine DIFW as a resident coldwater fishery for landlocked Atlantic salmon and brook trout.[49] GLHA also states that the West Branch is not an immediate priority for restoration of Atlantic salmon, alosines, and sea lamprey (Maine DMR and Maine DIFW, 2008), nor does the West Branch contain any designated critical habitat for Atlantic salmon and that access is not essential to the recovery of the species. Finally, GLHA notes that the Medway Project, which is located on the West Branch less than a mile downstream from the East Millinocket Development, does not have fish passage structures for Atlantic salmon, alosines, and sea lamprey, and likely would not have such facilities until the upstream fish passage facility at the Mattaceunk Project, located on the mainstream Penobscot River, is constructed and operational (anticipated in 2037). For these reasons, GLHA states that the requested upstream and downstream fish passage alternatives studies constitute PM&E measures and are premature at this time.

Discussion and Staff's Recommendation

As noted by GLHA, Atlantic salmon, alosines, and sea lamprey currently cannot reach the Projects, and likely would not have access to the West Branch until at least 2037, 15 years into the future. Therefore, because the noted species currently do not have access to the Projects and the extent to which these species would ultimately reach the Projects is speculative and will likely not be known for at least 15 years, we have no basis for recommending Maine DMR's requested upstream and downstream fish passage alternatives studies ([section 5.9(b)(5)].

**Study 24. Freshwater Mussel Survey**

Requested Study

FWS requests that GLHA conduct a Freshwater Mussel Survey in each of the project impoundments, the bypassed reaches, and in project-affected reaches downstream

[49] In its letter filed February 22, 2022, Maine DIFW indicated that any reintroduction of sea-run fish to the West Branch should be coordinated with Maine DIFW due to concerns with density-dependent interactions and introduction of invasive species to the Projects' waters.

from the dams and powerhouses (e.g., Upper Gorge, the Holbrook Side Channel, the West Branch Penobscot River downstream from Stone Dam, and Millinocket Stream). The goal of the study is to determine which freshwater mussels inhabit project-affected areas. The specific objective of the surveys is to determine the species composition, distributions, and abundances of freshwater mussels, including the state-listed brook floater,[50] yellow lampmussel, and tidewater mucket. FWS recommends the use of snorkel or dive equipment to perform the surveys, depending on the depth of water. FWS states that such surveys are needed because there is limited information in the PAD on the distribution and abundance of freshwater mussels in the vicinity of the projects. FWS notes that, according to the PAD, the last freshwater mussel survey was performed in limited sections of the West Branch, and was undertaken in 2009 by Maine DIFW. FWS states that the mussel survey results are needed to conduct an effects analysis and to develop reasonable and prudent conservation measures, as well as PM&E measures under the Endangered Species Act.

Comments on the Study

In its comments on the PSP, FWS requests that the Commission require this study as requested, adding that water level fluctuations and drawdowns associated with hydropower operations can decrease the amount of habitat available to mussels and can cause mortality to any mussels that may be exposed as a result of such operations.

In the RSP, GLHA does not propose to conduct FWS's requested mussel surveys. GLHA states that extensive mussel survey data are available for West Branch watershed from Maine DIFW's surveys during the 1990s and 2000s. GLHA reports that the surveys include areas where aquatic habitat is directly affected by the Projects' operations (e.g., riverine reaches immediately upstream of, and downstream from project facilities and in a number of the project impoundments. GLHA asserts that FWS's study request does not adequately define the methods to use in performing the surveys. Finally, GLHA contends that, based on Maine DIFW's survey data, there is no evidence the Projects are affecting mussel populations and distribution in the West Branch, and that FWS's request for mussel surveys constitutes basic research that is not likely to inform the development of license conditions.

Reply Comments

In its comments on the RSP, FWS, without elaboration, reasserts its request that GLHA conduct mussel surveys in each of the project impoundments, the bypassed reaches, and in project-affected reaches downstream from the dams and powerhouses.

[50] The brook floater is a priority at-risk species for FWS.

Discussion and Staff's Recommendation

The relative immobility of mussels makes them vulnerable to water level fluctuations associated with hydroelectric projects. As indicated above, Maine DIFW performed mussel surveys in the West Branch basin between 1996 and 2009, including in areas upstream of, and downstream from, the Projects, the Projects' impoundments, and in riverine reaches affected by the Projects' operation. Additional work has been done since that time (Maine DIFW, 2022) [section 5.9(b)(4)]. As documented in the PAD (*see* Table 5.4-13), Maine DIFW's surveys indicate that seven of the ten mussel species known to occur in Maine exist in the West Branch, including the triangle floater, creeper, eastern floater, eastern elliptio, eastern lampmussel, as well as the state-threatened brook floater, tidewater mucket, and yellow lampmussel. There are no federally listed species known to occur in the West Branch basin. While not all of the Projects' areas have been surveyed, it is reasonable to assume that if appropriate habitat and host species existed, mussels would be present in the unsampled areas and those mussels would be subject to water level fluctuations that occur during normal operations and maintenance activities.

FWS's recommendation that the surveys be done using snorkel or dive equipment, depending on the depth of water, does not provide sufficient detail to develop a study of potential project effects on mussels [section 5.9(b)(5)].

FWS asserts that recently collected mussel distribution and abundance information is needed to evaluate the Projects' effects on mussels and mussel habitat. However, as shown in the 10 years of operations data (included in Appendix S of the RSP) the operation of the Projects does not appear to have changed fundamentally since 2009. Therefore, the existing mussel survey data is sufficient to evaluate potential effects of the Projects' operations on mussels, and to inform the need for license conditions to protect mussels and their habitat in the West Branch [section 5.9(b)(5)].

For the reasons explained above, we do not recommend that GLHA conduct FWS's requested Freshwater Mussel Survey.

**Study 30. Common Loon Productivity Assessment**

Requested Study

Maine DIFW requests that GLHA conduct a Common Loon Productivity Assessment for the Millinocket Lake Storage and North Twin impoundments. The goals of the study are to: (1) evaluate common loon nesting success; (2) determine if Penobscot Mills Project operations affect loon productivity; and (3) assess causes of nest

failure to determine if these failures are influenced by project operations.[51] Maine DIFW's study would involve standard survey methods,[52] including weekly surveys by boat beginning in mid- to late-May and continuing through July (Taylor and Evers, 2009).[53] Data collected during the surveys, depending on the timing within the loon nesting cycle, would include: (1) the number of territorial pairs; (2) the delineation of territory boundaries defended by those pairs; (3) the number and location of nesting attempts; (4) the causes of any nest failure; (5) observations of clutch size and number of chicks hatched; and (6) documentation of chick survival. Field work would be required to collect data on the presence/absence of territorial loon pairs. If territorial pairs exist, then at least two additional years of field work would be needed to determine fledging rates and the causes of any observed nest failure.[54]

Comments on Study

In the RSP, GLHA does not propose to conduct Maine DIFW's requested study. In lieu of the study, GLHA proposes to use information obtained from the Historical Operations Data Assessment, along with the existing data documented from the 10 years of common loon nest monitoring for the two impoundments, to assess historic annual water levels at both the Millinocket Lake Storage and North Twin impoundments during the common loon breeding season and evaluate the potential effects of project operations on loon productivity. This information would then be applied to the North Twin impoundment, as well as the Millinocket Lake Storage impoundment, to better understand common loon habitat conditions and nesting success. Additionally, GLHA proposes to use the Operations Model to evaluate alternative operating scenarios, including the impoundment elevations, to be considered for the new licenses. This information would be compared to historical operations data to understand if changes in

[51] In its comment on the PSP, Maine DIFW revised its initial study request, but reiterated the need for GLHA to provide clarification regarding actual headpond water level fluctuations during the common loon breeding season (May 15 – July 31). Maine DIFW requested that study details, including goals, methodology, and anticipated reporting requirements be clearly explained in the RSP.

[52] Standard survey methods were developed by the Loon Preservation Committee in New Hampshire and the BioDiversity Research Institute, and have been adopted by the Northeast Loon Study Working Group.

[53] Bi-weekly surveys may be needed to monitor chick survival, and nest searching may require walking portions of shoreline.

[54] If fledging rates are lower than 0.48 chicks per territorial pair, which is needed to support a stable and self-sustaining population, then annual monitoring and possibly a raft management plan or more stable water levels may be necessary.

operation may affect nesting loons on the Millinocket Lake Storage and North Twin impoundments.

Reply Comments

In its comments on the RSP, Maine DIFW states that it supports GLHA's proposed approach. However, Maine DIFW reserves the right to reiterate its request for an assessment of common loon productivity at the Millinocket Lake Storage and North Twin impoundments.

Discussion and Staff's Recommendation

GLHA's existing data on common loons in the Millinocket Lake Storage impoundment, as well as the Ripogenus impoundment, comes from an initial 2-year survey in 1998 and 1999, followed by annual monitoring of common loon nesting habitat and success from 2000 to 2010. GLHA filed biennial reports with the Commission, which include information on impoundment elevations during the nesting season. The final October 19, 2010, monitoring report provides a summary of the results from the 10 years of monitoring on the Millinocket Lake Storage impoundment. The report documented numerous natural nesting areas and relatively stable water surface elevations during the loon nesting season in the impoundment.

The existing license for the Penobscot Mills Project allows for up to 10 feet of fluctuations to water surface elevations in the Millinocket Lake storage impoundment. However, in the RSP GLHA indicates that it has primarily operated the Millinocket Lake Storage and North Twin impoundments at relatively stable water levels, near the full pond elevation, that are protective of common loons during their nesting season (i.e., less than 0.5-foot increase or 1-foot decrease in elevation during 28-day periods from June 1 through July 15). The Operations Model would provide information on impoundment water surface elevations under alternative operating scenarios, and this data could be compared to historical operations data to further understand how changes in operation may affect nesting loons on the North Twin and Millinocket Lake Storage impoundments [section 5.9(b)(6)]. Therefore, we do not recommend that GLHA conduct Maine DIFW's initially proposed Common Loon Productivity Assessment for the Penobscot Mills Project, and, instead, recommend GLHA proposed study. Following the ISR filing, stakeholders can propose to modify the study plan, or propose new information gathering or studies [sections 5.15(d) and 5.15(e)].

**Study 35. West Branch Penobscot River Creel Survey**

Requested Study

In comments on the PSP (letter dated November 9, 2021), Edward Spear requests that GLHA conduct a creel survey on the West Branch of the Penobscot River to determine daily and annual angler use, effort, catch, method (e.g., drift boat, other watercraft, wading, etc.) and location of anglers fishing along the river between Ripogenus Dam and the base of Pockwockamus Falls. Mr. Spear requests that GLHA follow the methods employed in the 1978 creel surveys conducted during the previous relicensing effort.

Comments on Study

In the RSP, GLHA states that the 1978 creel surveys were used to collect data to inform its proposal for constructing a new dam (Big A) on the West Branch, downstream from the Ripogenus Project. The resulting creel survey data were also used in the last Ripogenus Project relicensing. At present, Maine DIFW conducts annual creel surveys in the West Branch of the Penobscot River, both formally (i.e., winter creel surveys) and informally (survey boxes). Further, as part of the Water Quality Study, GLHA proposes to compile and synthesize fisheries data in the Ripogenus Project area, including any recent creel survey data that may not have been discovered during development of the PAD. Therefore, GLHA contends that additional creel surveys are unnecessary.

Discussion and Staff's Recommendation

During the ILP's study period, Maine DIFW would conduct periodic creel surveys in the West Branch, which GLHA would compile and synthesize in support of its license applications. Further, as described in staff's recommended modifications to the Recreation Study, we recommend adding questions about fishing activities to the survey of recreation users. Because the Maine DIFW's surveys and data collected during the Recreation Study would provide information about angling at the Projects, additional creel surveys of the West Branch are not necessary at this time [section 5.9(b)(4)]. Therefore, we do not recommend that GLHA conduct the creel surveys requested by Mr. Spear.

# APPENDIX C

## Ripogenus Project and Penobscot Project Generation Data Over the Current License Term

### Table 1. Ripogenus Project No. 2572, Average Annual Generation, Inflow, and Water Year Classification

| *FY (Oct 1, 20xx through Sept 30, 20xx) | MWH Generated | Average Annual Inflow at Ripogenus (cfs) | Water Year Classification | *FY (Oct 1, 20xx through Sept 30, 20xx) | MWH Generated | Average Annual Inflow at Ripogenus (cfs) | Water Year Classification |
|---|---|---|---|---|---|---|---|
| 2021 | 180,520 | 1761 | Dry | 2001 | 178,884 | 1753 | Driest |
| 2020 | 242,794 | 2316 | Dry | 2021 | 180,520 | 1761 | Dry |
| 2019 | 257,450 | 3173 | Wet | 2002 | 145,541 | 1824 | Dry |
| 2018 | 252,437 | 2616 | Average | 2016 | 218,914 | 2072 | Dry |
| 2017 | 202,474 | 2994 | Wet-Average | 2004 | 157,878 | 2139 | Dry |
| 2016 | 218,914 | 2072 | Dry | 2020 | 242,794 | 2316 | Dry |
| 2015 | 221,456 | 2322 | Dry-Average | 2015 | 221,456 | 2322 | Dry-Average |
| 2014 | 224,936 | 2690 | Average | 2012 | 266,009 | 2377 | Dry-Average |
| 2013 | 238,835 | 2502 | Dry-Average | 2013 | 238,835 | 2502 | Dry-Average |
| 2012 | 266,009 | 2377 | Dry-Average | 2003 | 157,878 | 2588 | Average |
| 2011 | 289,100 | 3505 | Wet | 2018 | 252,437 | 2616 | Average |
| 2010 | 261,454 | 2669 | Average | 2010 | 261,454 | 2669 | Average |
| 2009 | 286,661 | 2981 | Wet-Average | 2014 | 224,936 | 2690 | Average |
| 2008 | 287,625 | 3409 | Wet | 2007 | 279,474 | 2956 | Wet-Average |
| 2007 | 279,474 | 2956 | Wet-Average | 2009 | 286,661 | 2981 | Wet-Average |
| 2006 | 290,661 | 3113 | Wet | 2017 | 202,474 | 2994 | Wet-Average |
| 2005 | 247,752 | 3554 | Wettest | 2006 | 290,661 | 3113 | Wet |
| 2004 | 157,878 | 2139 | Dry | 2019 | 257,450 | 3173 | Wet |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2003 | 157,878 | 2588 | Average | 2008 | 287,625 | 3409 | Wet |
| 2002 | 145,541 | 1824 | Dry | 2011 | 289,100 | 3505 | Wet |
| 2001 | 178,884 | 1753 | Dry | 2005 | 247,752 | 3554 | Wettest |
| 2000 | 252,947 | NA | NA | 2000 | 252,947 | NA | NA |
| 1999 | 196,672 | NA | NA | 1999 | 196,672 | NA | NA |
| 1998 | 217,643 | NA | NA | 1998 | 217,643 | NA | NA |
| 1997 | 233,799 | NA | NA | 1997 | 233,799 | NA | NA |

**Table 2. Penobscot Mills Project No. 2458, Average Annual Generation and Water Year Classification**

| *FY (Oct 1, 20xx through Sept 30, 20xx) | MWH Generated | Water Year Classification based on inflow to Ripogenus | *FY (Oct 1, 20xx through Sept 30, 20xx) | MWH Generated | Water Year Classification based on inflow to Ripogenus |
|---|---|---|---|---|---|
| 2021 | 301,853 | Dry | 2001 | 291,914 | Driest |
| 2020 | 348,301 | Dry | 2021 | 301,853 | Dry |
| 2019 | 336,823 | Wet | 2002 | 237,223 | Dry |
| 2018 | 314,289 | Average | 2016 | 318,878 | Dry |
| 2017 | 306,261 | Wet-Average | 2004 | 227,265 | Dry |
| 2016 | 318,878 | Dry | 2020 | 348,301 | Dry |
| 2015 | 318,447 | Dry-Average | 2015 | 318,447 | Dry-Average |
| 2014 | 358,832 | Average | 2012 | 355,557 | Dry-Average |
| 2013 | 343,097 | Dry-Average | 2013 | 343,097 | Dry-Average |
| 2012 | 355,557 | Dry-Average | 2003 | 227,265 | Average |
| 2011 | 338,956 | Wet | 2018 | 314,289 | Average |
| 2010 | 409,423 | Average | 2010 | 409,423 | Average |

**Table 2. Penobscot Mills Project No. 2458, Average Annual Generation and Water Year Classification**

| | | | | | |
|---|---|---|---|---|---|
| 2009 | 464,336 | Wet-Average | 2014 | 358,832 | Average |
| 2008 | 416,469 | Wet | 2007 | 404,609 | Wet-Average |
| 2007 | 404,609 | Wet-Average | 2009 | 464,336 | Wet-Average |
| 2006 | 436,855 | Wet | 2017 | 306,261 | Wet-Average |
| 2005 | 398,834 | Wettest | 2006 | 436,855 | Wet |
| 2004 | 227,265 | Dry | 2019 | 336,823 | Wet |
| 2003 | 227,265 | Average | 2008 | 416,469 | Wet |
| 2002 | 237,223 | Dry | 2011 | 338,956 | Wet |
| 2001 | 291,914 | Driest | 2005 | 398,834 | Wettest |
| 2000 | 372,515 | NA | 2000 | 372,515 | NA |
| 1999 | 330,455 | NA | 1999 | 330,455 | NA |
| 1998 | 348,224 | NA | 1998 | 348,224 | NA |
| 1997 | 367,451 | NA | 1997 | 367,451 | NA |

# APPENDIX D

## ENVIRONMENTAL JUSTICE STUDY METHODOLOGY

To address the potential effects of continued operation and maintenance of the Ripogenus and Penobscot Mills Hydroelectric Projects (Projects) on environmental justice communities of concern, please prepare an Environmental Justice Study Report that provides the following:

a) A table of racial, ethnic, and poverty statistics for each state, county, and census block group within the geographic scope of analysis. For the Projects, the geographic scope of analysis is areas within 1 mile of the project boundaries. The table should include the following information from the U.S. Census Bureau's most recently available American Community Survey 5-year Estimates for each state, county, and block group (wholly or partially) within the geographic scope of analysis:
    i. Total population;
    ii. Total population of each racial and ethnic group (i.e., White Alone Not Hispanic, Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, some other race, two or more races, Hispanic or Latino origin [of any race]) (count for each group);
    iii. Minority population including individuals of Hispanic or Latino origin as a percentage of total population;[1] and
    iv. Total population below poverty level as a percentage.[2]

The data should be collected from the most recent American Community Survey files available, using table #B03002 for race and ethnicity data and table #B17017 for low-income households. A template table is provided below.

[1] To calculate the percent total minority population, subtract the percentage of "White Alone Not Hispanic" from 100 percent for any given area.

[2] To calculate percentage of total population below poverty level, divide the total households below the poverty level by the total number of households and multiply by 100.

b) Identification of environmental justice populations by block group, using the data obtained in response to part a above, by applying the following methods included in EPA's *Promising Practices for EJ Methodologies in NEPA Reviews* (2016).[3]

   i. To identify environmental justice communities based on the presence of minority populations, use the "50 percent" and the "meaningfully greater" analysis methods. To use the "50 percent" analysis method, determine whether the total percent minority population of any block group in the affected area exceeds 50 percent. To use the "meaningfully greater" analysis determine whether any affected block group affected is 10 percent greater than the minority population percent in the county using the following process:

      1. Calculate the percent minority in the reference population (county)
      2. To the reference population's percent minority, add 10 percent (i.e., multiply the percent minority in the reference population by 1.1)
      3. This new percentage is the threshold that a block group's percent minority would need to exceed to qualify as an environmental justice community under the meaningfully greater analysis method.

   ii. To identify environmental justice communities based on the presence of low-income populations, use the "low-income threshold criteria" method. To use the "low-income threshold criteria," the percent of the population below the poverty level in the identified block group must be equal to or greater than that of the reference population (county).

c) A map showing the Projects' boundaries and location(s) of any proposed project-related construction in relation to any identified environmental justice communities within the geographic scope. Denote on the map if the block group is identified as an environmental justice community based on the presence of minority population, low-income population, or both.

d) A discussion of anticipated project-related effects on any environmental justice communities for all resources where there is a potential nexus between the effect and the environmental justice community. Examples of resource effects may include, but are not necessarily limited to, project-related effects on: erosion or

[3] Available online at https://www.epa.gov/sites/default/files/2016-08/documents/nepa_promising_practices_document_2016.pdf.

sedimentation of private properties; groundwater or other drinking water sources; subsistence fishing, hunting, or plant gathering; access for recreation; housing or industries of importance to environmental justice communities; and construction- or operation-related air quality, noise, and traffic. For any identified effects, please also describe whether or not any of the effects would be disproportionately high and adverse.

e) If environmental justice communities are present, please provide a description of your public outreach efforts regarding your project, including:
    i. a summary of any outreach to environmental justice communities conducted prior to filing the application (include the date, time, and location of any public meetings beyond those required by the regulations);
    ii. a summary of comments received from members of environmental justice communities or organizations representing the communities;
    iii. a description of information provided to environmental justice communities; and
    iv. planned future outreach activities and methods specific to working with the identified communities.

f) A description of any mitigation measures proposed to avoid and/or minimize project effects on environmental justice communities.

g) Identification of any non-English speaking groups, within the geographic scope of analysis, that would be affected by the project (regardless of whether the group is part of an identified environmental justice community). Please describe your previous or planned efforts to identify and communicate with these non-English speaking groups, and identify and describe any measures that you propose to avoid and minimize any project-related effects non-English speaking groups.

h) If new construction is proposed, identification of sensitive receptor locations (e.g., schools, day care centers, hospitals, etc.) within the geographic scope of analysis. Show these locations on the map generated in step c. Provide a table that includes their distances from project facilities and any project-related effects on these locations, including measures taken to avoid or minimize project-related effects.

This study should be conducted in consultation with the Penobscot Indian Nation and other relicensing stakeholders who express interest. When you file your final study report with the Commission, please include documentation of any consultation you conducted with entities that expressed interest in environmental justice, copies of their

comments, and an explanation of how you have addressed their comments in your final response.

**Environmental Justice Data Table Template**

| | RACE AND ETHNICITY DATA | | | | | | | | | | LOW-INCOME DATA |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Geography** | **Total Population (count)** | **White Alone Not Hispanic (count)** | **African American (count)** | **Native American/ Alaska Native (count)** | **Asian (count)** | **Native Hawaiian & Other Pacific Islander (count)** | **Some Other Race (count)** | **Two or More Races (count)** | **Hispanic or Latino (count)** | **Total Minority (%)** | **Below Poverty Level (%)** |
| **State** | | | | | | | | | | | |
| **County or Parish** | | | | | | | | | | | |
| **Census Tract X, Block Group X** | | | | | | | | | | | |

# APPENDIX E

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Ms. Kimberly D. Bose May 16, 2022
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426 Via Electronic Submission

RE: Penobscot Mills Project, FERC No. P-2458

Comments on Study Plan Determination for the Ripogenus Hydroelectric Project and the Penobscot Mills Hydroelectric Project Study 15, North Twin Impoundment Tributary Access Study

Dear Secretary Bose,

FERC staff rejected the above referenced, very reasonable MeDIFW study request. *"We do not recommend the Landlocked Salmon Radiotelemetry Study requested by Maine DIFW".* The grounds and logic used in this rejection are ill founded. The FERC endorsed study will not provide useful information and may not even confirm spawning information provided in the 1991 application. If radio tagging is not included in the study plans, I recommend MeDIFW withdraw from Study 15.

*"GLHA asserts that, while tracking seasonal movements of salmon via radiotelemetry and collecting landlocked salmon population dynamics data would be useful fishery management information, it is not necessary to assess the effects of project operation on landlocked salmon spawning*." As in many cases this is the Licensee's opinion, and, as usual, not fact based. Fishery management is based on project operation. If spawning and subsequent juvenile production is impacted by high or low lake levels, then these project operations created events directly impact fisheries management.

FERC states "*A radiotelemetry study could track movement of salmon and potentially detect spawning behavior in these areas (emphasis added)."* Salmon behavior is the key. Beginning in September, salmon move looking for suitable spawning areas, often the natal area. This is not an instantaneous process and often takes time. The natal spawning area may be unsuitable due to change in flow. Without radio tagging and tracking data (behavioral) pre spawning movement will be unknown. Salmon may visit two or more possible spawning areas and these events will remain unknown.

The exact method of determining possible lacustrine spawning areas is a mystery. Salmon are known to spawn in depth of up to four feet (See FERC P-3779 application). The method of determining salmon concentrated in these deeper lake areas is confusing. One possibility is scuba gear as the pre spawning salmon are apt to be ten feet or more below the surface.

Key known spawning areas are Nahmakanta Stream and the West Branch upstream of the North Twin Impoundment. FERC staff fails to explain how a North Twin Impoundment salmon will be differentiated from a West Branch salmon when observed at or near a West Branch spawning area. An impossible task without radio tagging.

FERC states "*Landlocked salmon are found infrequently downstream from North Twin Dam and are believed to be incidental dropdown individuals"* The 1991 Penobscot Mills Application reports an average catch of 200 legal size landlocked salmon below the North Twin Facility. Thus, there is no

foundation for FERC's statements. NO current fishery data has been provided and the status of the North Twin tailwater fishery is unknown. This statement is incorrect and biased toward the Licensee arguments.

FERC references "cost". NO mention of what these costs might be. What is the environmental cost of not performing this study? The Licensee is a multinational corporation that benefits from using a Maine resource to sell power though ISONE, a regional market. Given the magnitude of these licenses and the Licensee's resources, the minimum cost of this study should not be used as an excuse.

For the reasons outlined above, FERC staff should revisit the North Twin Impoundment Tributary Access Study Plan and make the necessary revisions.

Thank you for the opportunity to comment.

Ed Spear

307 Mt Hope Ave.
Bangor, Me 04401
Email; edspear1@yahoo.com
Phone; 207-217-4288

Kimberly D. Bose May 18, 2022
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426 Via Electronic Filing

Re: The Ripogenus Projects P-2572, FERC May 13, 2002 Filing; Study Plan Determination for the Ripogenus Hydroelectric Project and the Penobscot Mills Hydroelectric Project

Study Response 16. Ripogenus Impoundment Zooplankton Study

In the strongest language possible, I object to FERC's refusal to implement a study of the Ripogenus Impoundment zooplankton community. In rejecting this requests FERC ignores the extensive peer reviewed literature-based evidence on zooplankton populations, assumes facts not in evidence, miss quotes my initial study request, ignores Maine Department of Inland Fisheries and Wildlife (MeDIFW) objectives for the Ripogenus Impoundment and the downstream West Branch and cites costs. For the reasons listed below, I request FERC reconsider its decision.

! In my January 27, 2022 filing (see attached) I provided peer reviewed information on relationships between zooplankton-juvenile smelt and landlocked salmon (salmon). This information was conclusive. The Licensee refuted my request for zooplankton studies with legal arguments, rather than science, simply because the science supported my arguments. FERC in its Study Plan Determination (SPD) used generic statements to concur with the Licensee. Without zooplankton sampling how will the "structure and function" of resident populations be determined?

The Licensee in the PAD and subsequent filings have submitted 30-40 year old data and supported this with legal arguments. Requests for studies are rebutted with more legal arguments rather than science. The Licensee says "believe us", we care about the resources. The Licensee continues with a list of protection, mitigation and enhancement measures, items they failed miserably to meet in 2021. It is time for FERC to give equal consideration to agency and stakeholder study request

FERC initial error was accepting the licensee's contention that "nothing has changed". Why believe the Licensee when that recent filings demonstrate project operations, namely impoundment drawdowns, have changed? The years of relatively stable base flows and lake levels are gone. Some of the impacts of these drawdown are known; MeDIFW has identified a collapsed salmon and juvenile smelt population, acres of dewatered shoreline and unusable boat docks and launching ramps, lack of connectivity between lake basins. Other impacts are yet to be defined. One such impact is the status of the zooplankton community, a major component of the food website. As pointed out in my January 27, 2022 filing, the zooplankton-juvenile smelt relationship is complex. FERC used my intellectually honest statement as an excuse to deny the study request. "Complex" is not a valid reason to reject a study request. FERC is speculating on possible study results. The literature is replete with evidence suggesting that project operations e.g., drawdowns and timing of drawdowns, is impacting zooplankton and juvenile smelt populations. A this point of licensing, science and the need for knowledge overweighs "policy" and legal arguments. Citing random events as possible reasons for declines in the juvenile smelt populations, almost certainly associated with zooplankton populations ignores science.

! FERC Staff cited facts not in evidence. FERC talks about the food web, and then refuses to address self-evident issues. MeDIFW has documented a Ripogenus Impoundment salmon population in collapse, a situation that has existed for 15-20 years. I concur and commend MeDIFW on their creel survey effort. *"Moreover, GLHA notes that after years of Maine DIFW monitoring of the Chesuncook Lake fishery, Maine DIFW concluded that the depressed Ripogenus salmon fishery is due to an overabundance of landlocked salmon, which in turn has reduced the smelt forage base."* The above FERC quote is incorrec*t, 1)* MeDIFW believes there is an <u>overabundance of subadult salmon</u> and has acted to increase the harvest of salmon less than 16 inches 2) MeDIFW monitors the salmon fishery rather than the fish assemblage. I spent most of my 25 year career studying the fisheries of the Ripogenus Project waters. As noted before, I strongly disagree with MeDIFW's conclusion. As there have been no juvenile smelt collections e.g., trawls, hydroacoustic, etc., there are simply NO data.

Another “data gap”, actually a black hole. Neither peer reviewed literature nor MeDIFW data bases support the contention that the salmon population has been “out-of-balance” for 15-20 years (coincidental to the Licensee change in operations) and that over population of subadult salmon is the cause. Thus, MeDIFW conclusion is simply an opinion that is totally based on salmon while ignoring the literature on juveniles smelt and zooplankton population. In fact, NO post 1991 information is available on either juvenile smelt or zooplankton populations. NONE. Basing a 30 year license on opinion while ignoring extensive peer reviewed literature is a clear violation of the NEPA policy. FERC states “*In this instance, we have no reason to suspect that any adverse effects on zooplankton are specifically and directly related to lake level management in the Ripogenus impoundment”.* FERC has more than an adequate “reason” to suspect “adverse effects”. How about the decline in the Ripogenus Impoundment salmon/smelt population that coincides with the Licensee’s change in project operations? The refusal of a zooplankton study outlined Response 16 contradicts the exiting peer reviewed literature.

! FERC misrepresented my initial study request. In the January 27, 2022 filing I stated “*If used in conjunction with other water quality sampling events the collection costs are minimal. Fine mesh plankton nets can be “towed” behind the boat used in sampling Ripogenus Impoundment basins. The Caribou basin should be included in zooplankton sampling. Data collected in 2022 can then be compared to studies conducted in 1981 (see tables below; Vol VIII 1991 Rip Application). Locations, timing and methods of the 1981 Ripogenus Impoundment zooplankton surveys can be found in Volume VIII of the 1991 license application*”. Thus, my request was both well founded and well defined.

FERC also misquoted my comment on the need for zooplankton populations Study(s). “*Mr. Spear references the poor quality of the impoundment’s zooplankton community, smelt population”.* As no plankton data are available for the last 38 years it would difficult to make a quantitative judgement on the status on any plankton population. My statement was based on extensive literature review and MeDIFW data and the knowledge that juvenile smelt are in short supply. The peer-reviewed literature continues to support my contention. FERC staff should review these reference as they provide a compelling case for zooplankton study.

- Failure to study Ripogenus Impoundment zooplankton populations impacts MeDIFW objectives for the Ripogenus Impoundment and most importantly the downstream West Branch. It appears that FERC concurs with the importance of juvenile smelt to the Ripogenus Project salmon population and the importance of zooplankton as a smelt food source. The 1996 EIS discussed at length the role of smelt drift in creating a world class salmon fishery in the river downstream of McKay Station. Thus, FERC agrees on the nexus of the Ripogenus Impoundment smelt population and the West Branch salmon population. Thus, it follows that the food source of Ripogenus juvenile smelt, zooplankton, is key to smelt drift abundance in the West Branch. Determining the status of the Ripogenus Impoundment zooplankton (and juvenile smelt) populations will enable MeDIFW to meet fisheries goals in the West Branch below McKay Station and return these waters to their former status of a "destination fishery".
- FERC uses "cost" in their denial of a zooplankton study. It states this without any mention of what that cost might be. My request for Plankton tows and analysis, these are not "big ticket" items. Given the Licensee international status and financial capabilities quoting "cost" is a bit of a stretch. The status of the smelt/zooplankton comminutes is impacting two former regional famous fisheries. Given the fisheries importance of Ripogenus Impoundment and West Branch downstream of McKay Station in the 1996 EIS, the small cost should not be an issue.

Ed Spear
307 Mt Hope Ave.
Bangor, Me 04401
Email edspear1@yahoo.com
Phone 207-217-4288

Ms. Kimberly D. Bose January 27, 2022
Secretary,
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426.

VIA Electronic Filing
**Reference: Ripogenus Hydroelectric Project (P-2572-133)**
**RE:** A Study Request; The Need to Determine the Status of the Ripogenus Impoundment Zooplankton Population and its Relationship to Larval and Juvenile Rainbow Smelt (Osmerus mordax)

Operations of the Ripogenus Project have changed from the 1996 license conditions of relatively stable base flows and (following) rule curve (storage) guidelines. These flow and lake level changes have significantly altered the observable biotic communities, fish and macro invertrabrates as well as impacting guilds not readily visible e.g., planktonic. Little data exists, but the status of the Ripogenus Impoundment landlocked salmon (salmon) and rainbow smelt (smelt) populations is, as explained below, appalling. Information concerning planktonic communities of the Ripogenus Impoundment and West Branch of the Penobscot River below McKay Station (West Branch) is desperately needed. FERC staff, agencies and stakeholders require current data to make informed decisions.

The Maine Department of Inland Fisheries and Wildlife (DIFW) conducted surveys of the Ripogenus Impoundment landlocked salmon (salmon) fishery during 2018-2021. These salmon growth, food habitat and general abundance studies demonstrated a fishery in decline; adult salmon were fewer and in poor condition. DIFW cited the lack of young of the year (YOY)/Age I smelt as the problem. These small (2-5 inch) smelt are suitable in size as salmon prey. Age II and older smelt are generally too large to be useful prey items for adult salmon. Similar YOY smelt trends exist in the West Branch where salmon growth is well below 1980s levels and smelt are generally absent. To their credit DIFW responded to the depressed Ripogenus salmon fishery by increasing the harvest of sub adult and adult (>12 inches) salmon. The goal was to increase the Ripogenus YOY smelt population by reducing salmon predation, thus allowing the smelt population(s) to recover. This strategy has yet to prove successful. Peer

reviewed literature demonstrates that salmon predation on smelt is an unlikely cause of the continuous (10-15 years) lack of juvenile smelt.

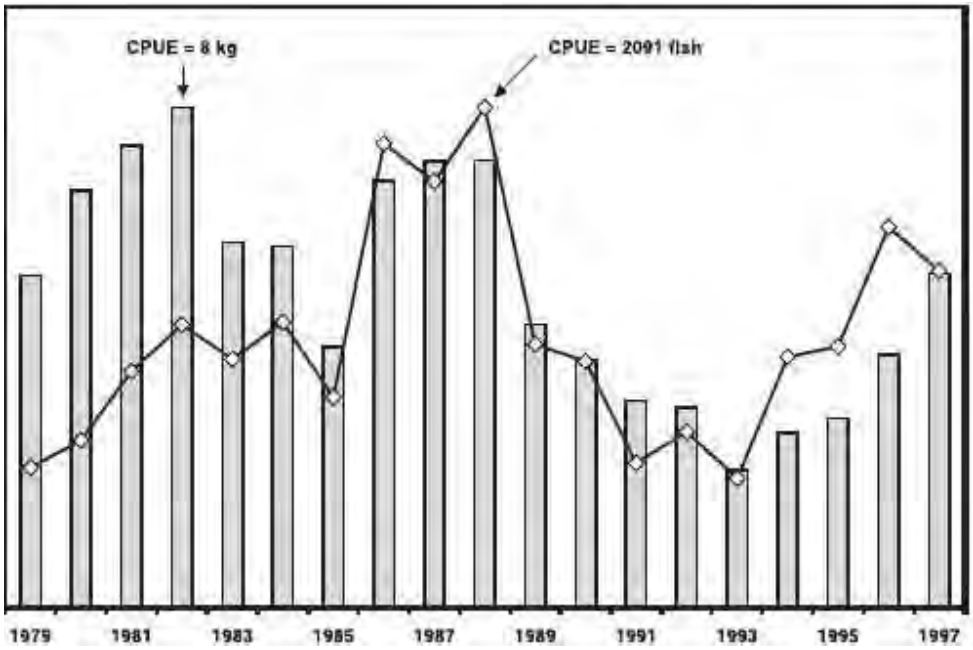
There are NO current data on the growth and abundance of smelt, phytoplankton or zooplanktons population in the Ripogenus Impoundment. To date, attempts to reduce the Ripogenus salmon population have failed to rejuvenate the smelt forage base. DIFW has stated that angler effort is not at the level needed to reduce the adult salmon population. While angler harvest offer possibilities in rebuilding smelt populations, there are better alternatives. A review of journal articles demonstrates that lake level management is the likely cause of a depressed/altered zooplankton community that has resulted in a depleted juvenile smelt forage base over the last ten plus years. These reasons all involve the abundance and structure of zooplankton populations. The cause and effect of lake level management e.g., timing of drawdowns, depth, temperature and fluctuation/compression of the littoral zone, lack of connectivity (between basins) need to be explored.

Smelt are vital forage species and in some areas also a hook and line or dip net fishery. Smelt are well distributed throughout the Northeast, Midwest (Kircheis and Stanley 1981) and Northwest where they exist as the sub species, *O. dentex*,. Because of their role as both a forage and table fish; smelt abundance, prey selection and habitat preference have been well studied. Without smelt as prey salmon populations collapse and cease to provide a fishery (Havey and Warner 1970).

A 1981 summary by Maine research biologists Fred Kircheis (MeDIFW) and Jon Stanley (UMO Coop Fish Unit) reviewed smelt populations in Maine and other Lakes throughout the Northeast. Regarding variability in smelt population abundance/densities, they concluded that *"such fluctuation are usual and do not appear related to predator abundance, rainbow smelt fishing or disease." Rainbow smelt larvae require small zooplankton such as rotifers when they begin feeding, "unavailability of suitable size plankton might limit survival of larvae" (McCullough and Stanley, 1979)."* (Kircheis and Stanley 1981). The literature provides insight into a litany of factors determining smelt abundance and growth. Based on extensive review of the literature, the primary reason for a reduction in larval/juvenile smelt year class is cannibalism by age II and older smelt. Smelt are known to demonstrate alternate year class strength, often resulting from cannibalism as well as variable population densities resulting from predation or

loss of suitable zooplankton as forage. Stetter et al. (2007) reported cannibalism at between 38 and 95 percent of YOY year class strength. This cannibalism typically produces alternate smelt years classes where larval survival is poor the first year but strong the next year(s) (Lantry, B.F., and Stewart, D.J. 2000). He and Labar (1994) studying Lake Champlin smelt populations noted that gaps in year class strength could extend for three to five years. The figure below demonstrates smelt year class variability (Mills et al. 2003). These data are from the USA side of Lake Ontario.

**Fig. 6.** Indices of relative abundance ( ) and biomass (bars) of age-1 and older rainbow smelt for a 21-year period, 1978 to 1998 caught in trawl tows of 10-min duration in late May – early June in U.S. waters of Lake Ontario. Indices are 3-year running means standardized to the maximum stratified CPUEs (catch-per-unit-effort) indicated. The X axis represent indices of abundance and biomass (0.0-1.2)




As there has been no change in the condition in West Branch salmon in ten plus years and DIFW has found a similar trend in Chesuncook, the lack of smelt has not been a cyclic event. Thus, both over-predation (by salmon) and cannibalism must be dismissed as factors in the ten to fifteen year decline of Ripogenus Impoundment smelt populations.

Depending on age, smelt have different temperature and depth preferences. Rooney, R.C and Paterson, M.J. (2009) provide excellent summaries of smelt life history requirements at life stage and depth. From these summaries we know

that "*YOY smelt are eurythermal and are usually found along the shoreline in depths of 7-20 feet. Yearlings become pelagic and move to deeper cooler water at "middle depths in the pelagic zone" unless the epilimnion temperature exceeded 18°C, in which case they congregated just beneath the thermocline" (Appenzeller and Leggett 1995). "Following fall turn over YOY smelt move to deeper water (Urban and Brandt 1993). Age II and older smelt can be found in the littoral zone in the spring but as surface waters warm, are usually distributed in the profundal zone with water temperature ranging for 6-14 C and depths greater than 15 meters." (Nellbring 1989)*. O'Gorman et al. (2000) reported that "smelt were forced into deeper water when Lake Ontario was colonized by exotic *Dreissena* mussels" and prey was reduced in shallower water.

Smelt are dependent on zooplankton and favor "large" bodied prey (including Diptera e.g., midge) and plankton communities can change with season and lake basin. Sheppard et al. (2012) described smelt food preferences in a Manitoba lake. "The Diet of freshwater population of rainbow smelt is generally composed of copepods and cladocerans (including Daphnia spp., Eubismina and Bossmina) (Urban and Brandt, 1993; Hrabik et al., 1998; Beisner et al., 2003; Johnson et al., 2004)". Selectivity of zooplankton prey varies with smelt age (and size). YOY Smelt (larval smelt >30 mm) are dependent on zooplankton and without suitable prey, populations collapse. Hrabik et al. (1998) described calanoid copepods as "favored prey". Age I and older smelt favor larger prey. Karnitz, J (1992) studying Lake Oahe Plankton found "Rainbow smelt prey were significantly larger than mean size of zooplankton in the environment" and that feeding increased with water temperature.

Zooplankton species composition can very between lake basins. Zooplankton communities in Lake George differed between two basins. "Large bodies zooplankton species were favored over smaller size species. Daphnia pulicaria that were dominant in one basin and were generally absent in the other basin where Mysis relicta was the dominate smelt prey item" (Siegfried, C. 1987). *Mysis* was most important in rainbow smelt diets in Western Lake Superior where smelt were again reported to choose larger taxa. Johnson et al (2004) reported a shift in species from prior studies of the Lake Superior zooplankton communities. Johnson, B.M., and Goettl, J.P. (1999) studying Horsetooth Reservoir smelt predation on zooplankton found "during 1989–1994 the abundant rainbow smelt population apparently reduced April and May crustacean zooplankton

concentrations from historical levels of 40–80 organisms/L to less than 1.0 organism/L, and a switch occurred in the cladoceran species composition." In later years the smelt population declined and the zooplankton community rebounded. Other authors referenced declines in zooplankton abundance resulting from piscivorous predation. And while there were shifts in taxa, in all cases, zooplankton populations returned to prior levels.

The above paragraphs provide compelling evidence of the relation between the abundance, suitability and availability of zooplankton populations as prey as related to smelt abundance and survival. The collapse of the Ripogenus Projects zooplankton-smelt prey relationship has been long-term, perhaps fifteen years. The exact mechanisms that created depressed zooplankton and Juvenile smelt declines in the Ripogenus Impoundment are unknown, but they are directly related to lake level management. Loss of shallow embayments (as hatchling habitat), compressed or shifting littoral zones reduce or eliminate critical larval or YOY smelt habitat, thus favoring older (and larger) age classes that prefer deeper water. These same factors apply to zooplankton communities that may have changed to meet altered intra species competition, food sources (phytoplankton) or micro habitat needs: depth, temperature, light (Appenzeller, A .and Leggett, W. 1995, Emery, A.R. 1973).

The status of the Ripogenus plankton population(s) needs to be defined. Zooplankton surveys need to be included in Ripogenus Impoundment water quality studies recommended by MeDEP. If used in conjunction with other water quality sampling events the collection costs are minimal. Fine mesh plankton nets can be "towed" behind the boat used in sampling Ripogenus Impoundment basins. The Caribou basin should be included in zooplankton sampling. Data collected in 2022 can then be compared to studies conducted in 1981 (see tables below; Vol VIII 1991 Rip Application). Locations, timing and methods of the 1981 Ripogenus Impoundment zooplankton surveys can be found in Volume VIII of the 1991 license application. To "fill in data gaps", FERC needs to require similar studies as part of the MeDEP October 2021 Water Quality Study request.

Historically the Ripogenus Impoundment supported an excellent salmon fishery and the Impoundment's smelt population was exported downstream ("drift") through McKay Station where it created and then supported the "world class West Branch salmon fishery". DIFW filings have demonstrated that these fisheries have collapsed. Echoing earlier works of Havey and Warner (1970), the DIFW

2012 management plan states, “Without adequate numbers of smelts, salmon growth and condition can become poor, markedly reducing their value as a sportfish” (Maine Salmon Management Plan. 2012). Without the export/drift of smelt, the West Branch fishery will disappear. FERC needs to ensure these two unique fisheries are returned to 1980s levels described by FERC staff in the 1996 EIS.

17-23 MAY 1981

| TAXA | RIPOGENUS LAKE (RIP1) SURFACE DENSITY* | RIP1 SURFACE % | RIP1 OBLIQUE DENSITY | RIP1 OBLIQUE % | RIPOGENUS LAKE (RIP1B) SURFACE DENSITY | RIP1B SURFACE % | RIP1B OBLIQUE DENSITY | RIP1B OBLIQUE % | BIG EDDY SURFACE DENSITY | BIG EDDY SURFACE % |
|---|---|---|---|---|---|---|---|---|---|---|
| ROTIFERA | 207141 | 42.3 | 350211 | 79.7 | 60583 | 40.5 | 181556 | 62.7 | 95170 | 78.1 |
| *Asplanchna* spp. | 694 | 0.1 | 669 | 0.2 | 48 | <0.1 | 252 | 0.1 | 83 | 0.1 |
| *Conochilus* spp. | | | | | | | | | | |
| *Filinia* spp. | | | | | | | | | | |
| *Kellicotia longispina* | 191903 | 39.1 | 333271 | 75.9 | 58274 | 39.0 | 171941 | 59.4 | 94359 | 77.5 |
| *Keratella* spp. | 233 | <0.1 | 1000 | 0.2 | 798 | 0.5 | 1407 | 0.5 | 56 | <0.1 |
| Soft-bodied Rotifers (small) | 14310 | 2.9 | 15049 | 3.4 | 1464 | 1.0 | 7807 | 2.7 | 672 | 0.6 |
| CLADOCERA | 152874 | 31.2 | 24840 | 5.7 | 40869 | 27.3 | 42074 | 14.5 | 6943 | 5.7 |
| *Bosmina* spp. | 19321 | 3.9 | 3285 | 0.7 | 22893 | 15.3 | 20111 | 6.9 | 1971 | 1.6 |
| *Camptocercus* spp. | | | | | | | | | | |
| *Ceriodaphnia* spp. | 17837 | 3.6 | 2512 | 0.6 | 2810 | 1.9 | 3511 | 1.2 | 719 | 0.6 |
| *Chydorus* spp. | | | | | | | | | | |
| *Daphnia longiremis* | 11568 | 2.4 | 3266 | 0.7 | 714 | 0.5 | 1674 | 0.6 | 508 | 0.4 |
| *Diaphanosoma leuchtenbergianum* | | | | | | | | | | |
| *Holopedium gibberum* | 103840 | 21.2 | 15704 | 3.6 | 14286 | 9.5 | 16556 | 5.7 | 3744 | 3.1 |
| *Leptodora kindtii* | 103 | <0.1 | | | 119 | 0.1 | 222 | 0.1 | | |
| COPEPODA | 130185 | 26.6 | 64090 | 14.6 | 48155 | 32.2 | 66044 | 22.8 | 19674 | 16.2 |
| Cyclopoids | 33910 | 6.9 | 15593 | 3.6 | 2190 | 1.5 | 3333 | 1.2 | 3087 | 2.5 |
| Copepods nauplii | 86239 | 17.6 | 46292 | 10.5 | 44560 | 29.8 | 60652 | 20.9 | 16024 | 13.2 |
| *Diaptomus pigmaeus* | 10036 | 2.0 | 2206 | 0.5 | 1405 | 0.9 | 2059 | 0.7 | 563 | 0.5 |
| *Epischura lacustris* | | | | | | | | | | |
| ALL ZOOPLANKTON TAXA | 490200 | 100.0 | 439141 | 100.0 | 149607 | 100.0 | 289674 | 100.0 | 121787 | 100.0 |

Blank spaces represent zero density or percent for individual taxa, i.e. species not present in sample.
*Density and percentage based on a mean of 3 replicate samples

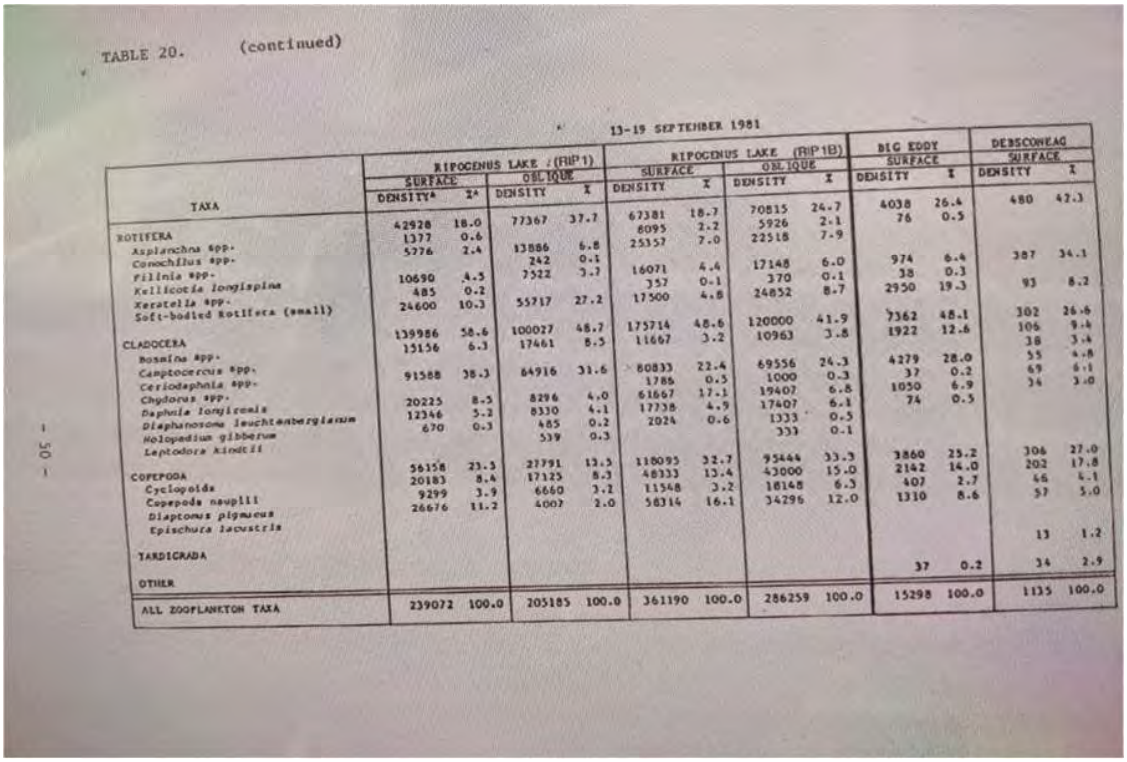


TABLE 20. (continued)

13-19 SEPTEMBER 1981

| TAXA | RIPOGENUS LAKE (RIP1) SURFACE DENSITY* | RIP1 SURFACE % | RIPOGENUS LAKE (RIP1) OBLIQUE DENSITY | RIP1 OBLIQUE % | RIPOGENUS LAKE (RIP1B) SURFACE DENSITY | RIP1B SURFACE % | RIPOGENUS LAKE (RIP1B) OBLIQUE DENSITY | RIP1B OBLIQUE % | BIG EDDY SURFACE DENSITY | BIG EDDY SURFACE % | DEBSCONEAG SURFACE DENSITY | DEBSCONEAG SURFACE % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ROTIFERA | 42928 | 18.0 | 77367 | 37.7 | 67381 | 18.7 | 70815 | 24.7 | 4038 | 26.4 | 480 | 42.3 |
| Asplanchna spp. | 1377 | 0.6 | | | 8095 | 2.2 | 5926 | 2.1 | 76 | 0.5 | | |
| Conochilus spp. | 5776 | 2.4 | 13886 | 6.8 | 25357 | 7.0 | 22518 | 7.9 | | | | |
| Filinia spp. | | | 242 | 0.1 | | | | | | | | |
| Kellicotia longispina | 10690 | 4.5 | 7522 | 3.7 | 16071 | 4.4 | 17148 | 6.0 | 974 | 6.4 | 387 | 34.1 |
| Keratella spp. | 485 | 0.2 | | | 357 | 0.1 | 370 | 0.1 | 38 | 0.3 | | |
| Soft-bodied Rotifera (small) | 24600 | 10.3 | 55717 | 27.2 | 17500 | 4.8 | 24852 | 8.7 | 2950 | 19.3 | 93 | 8.2 |
| CLADOCERA | 139986 | 58.6 | 100027 | 48.7 | 175714 | 48.6 | 120000 | 41.9 | 7362 | 48.1 | 302 | 26.6 |
| Bosmina spp. | 15156 | 6.3 | 17461 | 8.5 | 11667 | 3.2 | 10963 | 3.8 | 1922 | 12.6 | 106 | 9.4 |
| Camptocercus spp. | | | | | | | | | | | 38 | 3.4 |
| Ceriodaphnia spp. | 91588 | 38.3 | 64916 | 31.6 | 80833 | 22.4 | 69556 | 24.3 | 4279 | 28.0 | 55 | 4.8 |
| Chydorus spp. | | | | | 1786 | 0.5 | 1000 | 0.3 | 37 | 0.2 | 69 | 6.1 |
| Daphnia longiremis | 20225 | 8.5 | 8296 | 4.0 | 61667 | 17.1 | 19407 | 6.8 | 1050 | 6.9 | 34 | 3.0 |
| Diaphanosoma leuchtenbergianum | 12346 | 5.2 | 8330 | 4.1 | 17738 | 4.9 | 17407 | 6.1 | 74 | 0.5 | | |
| Holopedium gibberum | 670 | 0.3 | 485 | 0.2 | 2024 | 0.6 | 1333 | 0.5 | | | | |
| Leptodora kindtii | | | 539 | 0.3 | | | 333 | 0.1 | | | | |
| COPEPODA | 56158 | 23.5 | 27791 | 13.5 | 118095 | 32.7 | 95444 | 33.3 | 3860 | 25.2 | 306 | 27.0 |
| Cyclopoida | 20183 | 8.4 | 17125 | 8.3 | 48333 | 13.4 | 43000 | 15.0 | 2142 | 14.0 | 202 | 17.8 |
| Copepoda nauplii | 9299 | 3.9 | 6660 | 3.2 | 11548 | 3.2 | 18148 | 6.3 | 407 | 2.7 | 46 | 4.1 |
| Diaptomus pigmaeus | 26676 | 11.2 | 4007 | 2.0 | 58314 | 16.1 | 34296 | 12.0 | 1310 | 8.6 | 57 | 5.0 |
| Epischura lacustris | | | | | | | | | | | | |
| TARDIGRADA | | | | | | | | | | | 13 | 1.2 |
| OTHER | | | | | | | | | 37 | 0.2 | 34 | 2.9 |
| ALL ZOOPLANKTON TAXA | 239072 | 100.0 | 205185 | 100.0 | 361190 | 100.0 | 286259 | 100.0 | 15298 | 100.0 | 1135 | 100.0 |

- 50 -

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Ed Spear
307 Mt Hope Ave.
Bangor, Me 04401
Email: edspear1@yahoo.com
Phone: 207-217-4288

Kimberly D. Bose May 20, 2022
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426 Via Electronic Filing

Re: The Ripogenus Project P-2572. Two observed Article 406 Violation.

Article 406 requires a flow of 35 cfs for the period beginning June 1, continuing until October 15. At that time flows are increased to 65 cfs. I have seen no E-library filing that suspends Article 406. The Ripogenus Impoundment is "full". The Holbrook Bypass Channel spawning and incubation flow requirement of 65 cfs was willfully violated.

During the mornings of May 17 and 18, I observed low West Branch flows in the areas near the Big Eddy Campground. A check of the Safewaters website confirmed my observation, as when I checked the Safewaters website, the given flow was 1276 cfs (Flows were reduced in late afternoon and increased in the morning). Unfortunately, Safewaters does not provide archival data. As I noted in my May 9, 2022 filing, flows in the range observed earlier this week do not meet the Article 406 requirement of 65 cfs. This is a license violation.

While not a license violation, the Safewaters website listed flows for the week of May 16 as being in the range of "2400" and "2700" cfs (this information is no longer available on the Safewaters website). Thus, recreationists who planned to fish or boat West Branch were disappointed when they arrived only to find a "dry river". Ripogenus Project waters are warming, fish and aquatic community activity is increasing. Daily low flow events disrupt fish and aquatic insect activity as well as fishing opportunity.

Thank you for the opportunity to comment

Ed Spear

307 Mt Hope Ave.
Bangor, Me 04401
Email: edspear1@yahoo.com
Phone 207-217-4288

May 24, 2022

Ms. Kimberly D. Bose
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

TROUT UNLIMITED
MAINE COUNCIL

**Via online submission to: http://www/ferc.gov (cross-filed)**

Subject: **Maine Council of Trout Unlimited Comments on the Brookfield letter Response to Minimum Flow Complaints for the Ripogenus Project (P-2572) dated June 8, 2022**

Dear Secretary Bose:

On behalf of its six chapters and over 2,000 members, Maine Council of Trout Unlimited ("TU)" submits these comments on the Brookfield letter Response to Minimum Flow Complaints for the Ripogenus Project (P-2572) submitted by GLHA ("Brookfield" or "Operator") dated June 8, 2022.

**Background**

In its June 8, 2022 letter, Brookfield provided the information that FERC requested to investigate the flow excursion events that Brookfield itself had reported[1] and consequent violation of license Article 406 provisions noted by Ed Spear.[2] Brookfield states that these complaints are "without merit."[3] The contents of the Brookfield letter fail to show that Brookfield was operating the project in accordance with the applicable articles of the current license or basing water management on established plans. The Operator must bear some responsibility for the extended low flow excursions.

**Discussion**

As Brookfield states in its response to the TU complaint: "*the WUP is the basis for the licensed water management requirements (which are intended to balance public safety, recreational,*

[1] Brookfield letter Response to Minimum Flow Complaints for the Ripogenus Project (P-2572) submitted by GLHA dated June 8, 2022.
[2] Ed Spear letter dated May 9, RE: The Ripogenus Projects P-2572, Great Lakes Hydro America's April 29, 2022 Filing, Articles 402 and 406: Violations not Excursions? Ed Spear letter dated May 20, RE: The Ripogenus Project P-2572. Two observed Article 406 Violation.
[3] Brookfield letter Response to Minimum Flow Complaints for the Ripogenus Project (P-2572) submitted by GLHA dated June 8, 2022, page 4: "In summary, the complaints filed by Mr. Heinz and Mr. Spear alleging noncompliance with Article 402 of the Ripogenus Project license are without merit, as GLHA's water management actions at the Ripogenus Project during the recent severe drought conditions are fully justified and entirely in compliance with the Project license."

*environmental, and power generation needs) under which GLHA currently operates both Projects*."[4] Brookfield fails to explain where and how the balancing occurred. It goes on to list reasons why the plan is inadequate due to changes to storage capacity within the watershed:

> "*GLHA notes that while the 1991 WUP was developed to serve as a comprehensive and long-term management plan for the storage system, the WUP also did not anticipate that the subsequent (2004) FERC license for the upstream Storage Project (FERC No. 2634) would result in a substantial loss of available storage capacity in the West Branch of the Penobscot River drainage due to the following drawdown limitations:*
>
> *Canada Falls Lake (0.56 billion cubic feet [bcf] lost)*
>
> *Seboomook Lake (2.68 bcf lost)*
>
> *Penobscot Lake (0.06 bcf lost)*
>
> *Dole Pond (0.16 bcf lost)*
>
> *Loon Lake (0.46 bcf lost)*
>
> *Harrington Lake (0.01 bcf lost)*
>
> *Additional water storage on the West Branch has been lost since 1996 with the implementation of wetlands mitigation at Umbazooksus Lake (0.45 bcf lost) and the transfer of Nesowadnehunk Lake Dam to a stakeholder (0.42 bcf lost). All told, total storage capability on the West Branch has been reduced by nearly 5 billion cubic feet since the WUP was finalized in 1991, thereby hindering WUP-based water management in the West Branch drainage."*[5]

The above losses were agreed to by the previous operator who apparently believed that the storage capacity was manageable, these were not changes imposed by FERC or some other government organization. Loon Lake, Harrington Lake, Umbazookus Lakes and Dole Pond contributed little to overall storage and were scheduled for abandonment. Brookfield should have been well aware of these changes when it acquired the project about ten years ago.

Regardless of this, Brookfield is required to operate under the articles of the existing license. If these articles had become impossible for the operator to observe, the mechanism for addressing the problems exists:

> "*A description of how flow-related recreation will be monitored and effectiveness of the Water Use Plan will be reviewed every 10 years over the term of the project license*."[6]

The Brookfield response letter goes on to say:

> "*Finally, as part of its contractual obligations with ISO – New England, GLHA is required to perform a CCA (claimed capability audit) test each summer (and once every 3 years in the winter) by maximizing generation at its facilities for short periods of time. The 2021*

[4] Brookfield letter dated June 8, 2022, page 3.
[5] Ibid.
[6] Ripogenus License, Project Number 2572 Issued October 22, 1996, page 31.

*CCA test was performed at the Ripogenus Project on August 12, 2021, which resulted in a flow of 3,300 cfs for several hours, well above the minimum flow."*[7]

This is misleading in two respects: there were higher than needed releases unrelated to CCA test, and ISO New England is only concerned with power generation, not environmental compliance. Brookfield has submitted lake level and flow data that covers August 2021 and more.[8] Figure 1 shows average flows and impoundment level submitted by Brookfield; supporting data is provided as Attachment A. Maximum two-generator operations is 2400 cfs.[9] For significant periods during 2021, Brookfield operated three generators at McKay Station. There was no apparent attempt to fill the Ripogenus-Chesuncook Impoundment. Of additional concern it that the CCA tests were conducted in August, not earlier in the year when more water should be available in the watershed. Target lake levels in other projects Brookfield operates are typically set to occur annually on June first, the CCA tests should have been conducted prior to then.

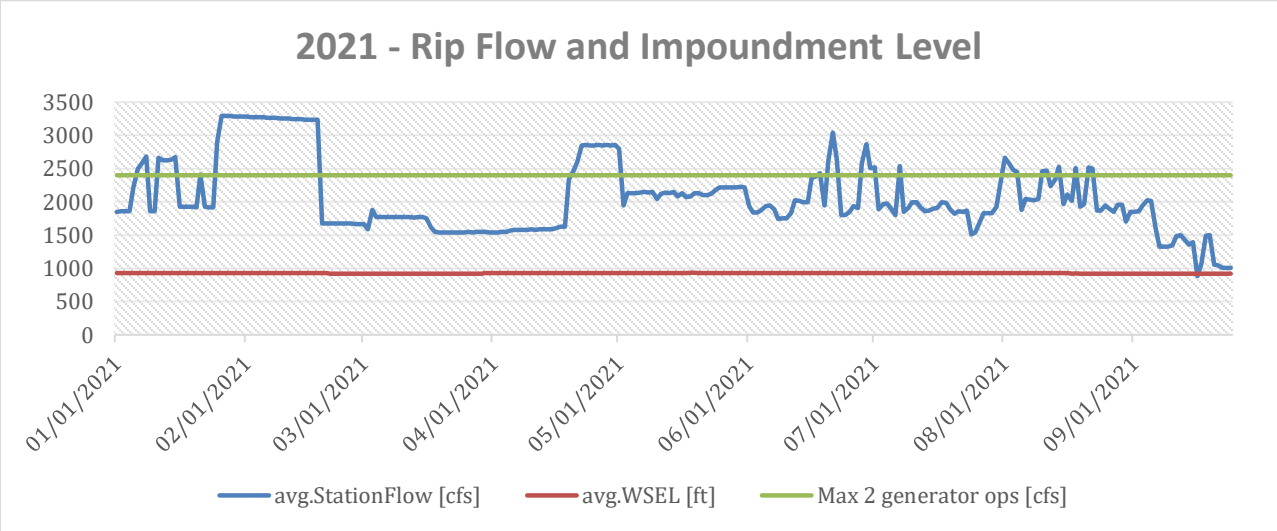



**Figure 1**

[7] Brookfield letter dated June 8, 2022, page 3.
[8] Ripogenus Revised Study Plan, Appendix S 2010-2021 - Daily Operations Data.
[9] Preapplication Document, Part 1 dated 2021, page 4-15, Table 4.3-1.

Figure 2 shows more granular flow data only from October 2021 to May 2022 also supplied by Brookfield.[10] Due to the size of the data set, we have not attached it. Examining the charts side by side, the blue lines showing flows are nearly continuous.

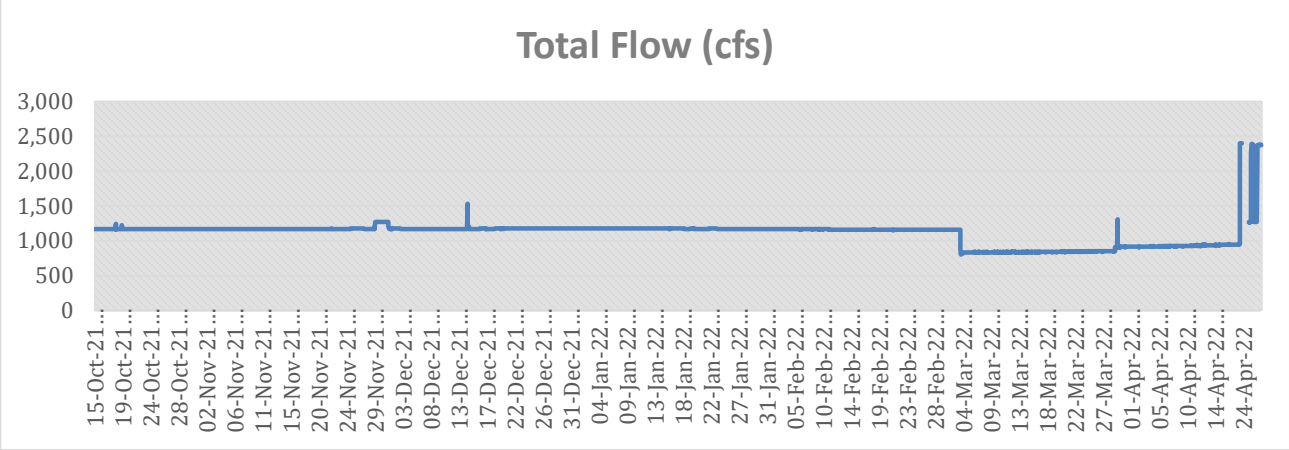



**Figure 2**

Contrast these charts with the Rule Curve for the project, EIS Figure D-1.[11]

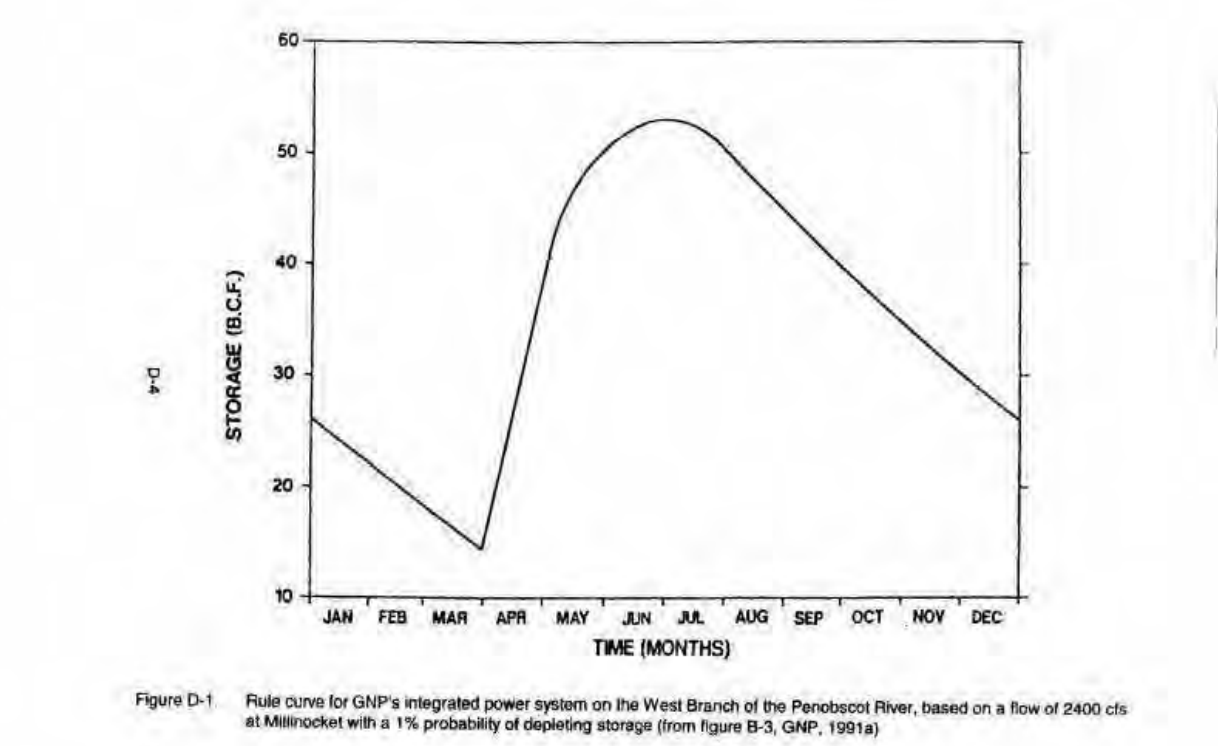



Figure D-1 Rule curve for GNP's integrated power system on the West Branch of the Penobscot River, based on a flow of 2400 cfs at Millinocket with a 1% probability of depleting storage (from figure B-3, GNP, 1991a)

[10] Brookfield letter dated June 8, McKay / Ripogenus Hourly Flows, page 9 and subsequent.
[11] Final Environmental Impact Statement, Upper Penobscot River Basin Volume 1, Appendix D.

Given the expectations indicated by the EIS approved Rule curve, TU does not see how continued peaking operations shown by Figure 1 and not discontinued by Brookfield that it was painfully apparent that minimum required spawning and incubation flows could not be maintained. Brookfield continues to blame dry conditions, but these conditions began in 2020. When Great Northern Paper operated the project, the power demands were based on the needs of the mills, not the grid which pays a premium for power supplied during peak periods. Brookfield has what may be the most modern hydro operations control center in the country located in Marlborough, Massachusetts. It was profit, not license requirements and certainly not the needs of the environment, which drove the operational decisions Brookfield made in 2021. Brookfield states that: "*…the complainants have the benefit of retrospectively criticizing GLHA's water management actions (as opposed to GLHA's need to implement water management actions in real time)* ..."[12] This statement ignores the fact that Brookfield had just dealt with dry conditions in 2020. Looking further back, 2016 was a dry year as well.

Brookfield did not note that the current license, in addition to minimum flow requirements for whitewater, spawning, etc. that were the focus of its flow excursion report[13] also considers other factors:

> *"These specified minimum flows shall be the minimum flows for each hourly period (measured on the basis of an hourly average). The recreational flow for each month from May through September shall be determined on the first day of each month. This determination shall be based on an analysis of Total Available Water, as described in the Water Use Plan presented in the application for new license filed December 17, 1991, pages 10-14 of Water Use Plan, Vol VII. The determination of "wet", "normal", or "dry" shall remain constant during the month based on the first day of the month classification. The range of "normal" available water represents the expected available water during normal hydrologic conditions. It is defined as the range between x-s and x+s, where "x" is the mean value and "s" the standard deviation. Based on a statistical analysis, total available water would be expected to be within this "normal" range two-thirds of the time, and outside of this range ("wet" or "dry" years) one-third of the time. The 15-year period of record from 1976 to 1990 shall be used for analysis of available water for the first 10 years of the license."*[14]

This was not the procedure followed by Brookfield when it chose to operate below spawning and incubation flows for an extended period. Analysis of hourly 2021 data may show additional license violations that cannot be detected using the minimum, average, and maximum data that Brookfield supplied with the Revised Study Plan.

[12] Brookfield letter dated June 8, page 1.
[13] Brookfield Ripogenus Project (FERC No. 2572-ME); Minimum Flow Excursion dated April 28, 2022.
[14] Ripogenus License, Project Number 2572 Issued October 22, 1996, page 31.

If this were not enough, Brookfield recently filed another significant Flow Excursion Report for the Penobscot Mills Project covering the period from March 4, 2022 to April 19, 2022, failure to maintain minimum flows.[15] Again, Brookfield blames dry conditions; again, Brookfield's operation of the Ripogenus Project must be considered a major factor.

It should be noted that currently most of Northern Maine including the project area is no longer in a drought condition as shown by this graphic.[16] White areas are not in a drought condition, yellow areas are abnormally dry, light orange area are experiencing moderate drought. The Ripogenus-Chesuncook Reservoir is full and Brookfield has resumed three generator operations.

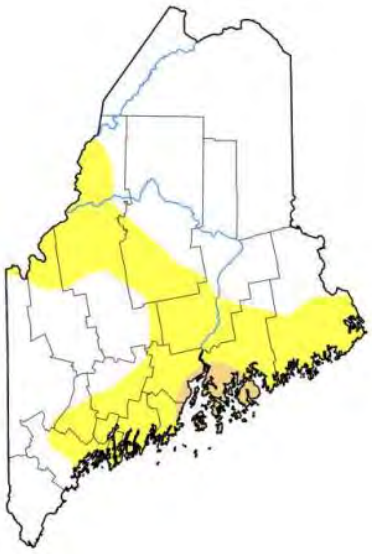


**Figure 3**

**Conclusion with Requests**

Maine TU Council appreciates the Commission's continuing attention to compliance issues involving the Ripogenus and Penobscot Mills Projects. Compliance history is a factor to be considered during the final licensing phase and we trust that the information contained in this filing will prove useful then as well as now.

The concerns stated by TU and Ed Spears are not "without merit" as Brookfield asserts. We ask that the Commission look further into Brookfield's flow excursions and attempt to find justification for any of the periods of three generator operations at McKay Station that occurred in 2021 on any but a profit basis.

Brookfield's response to FERC's request for flow data provided information but failed to provide convincing evidence or rationale to justify its reported flow excursions. Brookfield violated its license by the way it operated the Ripogenus Project in 2021 and 2022 because the need to go below established flow levels was due in part to poor water management and peaking operations. Due to the widespread harms this caused ranging from dewatering loons' nests and denying boating activities on Chesuncook Lake to adverse effects on salmonid spawning and incubation, enforcement action is justified. Brookfield has operated the project for ten years, so

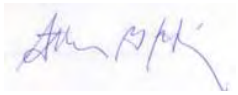
[15] Brookfield letter dated April 28, 2022, Subject: Penobscot Mills Project (FERC No. 2458); Millinocket Development: Run-of-River and Minimum Flow Excursion.
[16] USGS U.S. Drought Monitor Data valid: June 21, 2022 at 8 a.m. EDT accessed at https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?ME.

inexperience is not a valid excuse. TU reiterates its proposal that Brookfield be required to install a USGS compatible flow gage between McKay Station and Telos Bridge, and adds that a lake level gage be installed on Chesuncook Lake – both at Brookfield expense and to be maintained at Brookfield expense for the next ten years. We think that this would not only be appropriate but would also serve to prevent stakeholders filing low flow reports with FERC and necessitating investigations where if a USGS gage were present, no report would need to be filed.

Other concerns stated in TU's earlier filing[17] on this matter remain germane. TU reiterates its request for a copy of the Brookfield Renewable 11th Part 12D Independent Consultant's Safety Inspection Report and associated Potential Failure Mode Analysis Addendum for the Ripogenus Project under P-2572, Accession Number 20211229-5198, especially the addendum as twice previously requested.

We have cross-filed this document to dockets 2572-133 and P-2458-247 as it bears directly on the relicensings in progress. Brookfield cannot reasonably claim in compliance-related matters that it could not meet license flow requirements while claiming on relicensing studies-related matters that thirty-year-old studies are sufficient. When the Initial Study Report for the project is issued, it should be closely scrutinized to ensure that it contains adequate information on which to base future operational requirements and a Water Use Plan that will prevent future extended periods of low flow likely to have a detrimental effect on the fish and other aquatic life.

Sincerely and respectfully,



Stephen G. Heinz
Maine TU Council FERC Coordinator

Additional distribution: FERC Dockets P-2572-133, P-2458-247

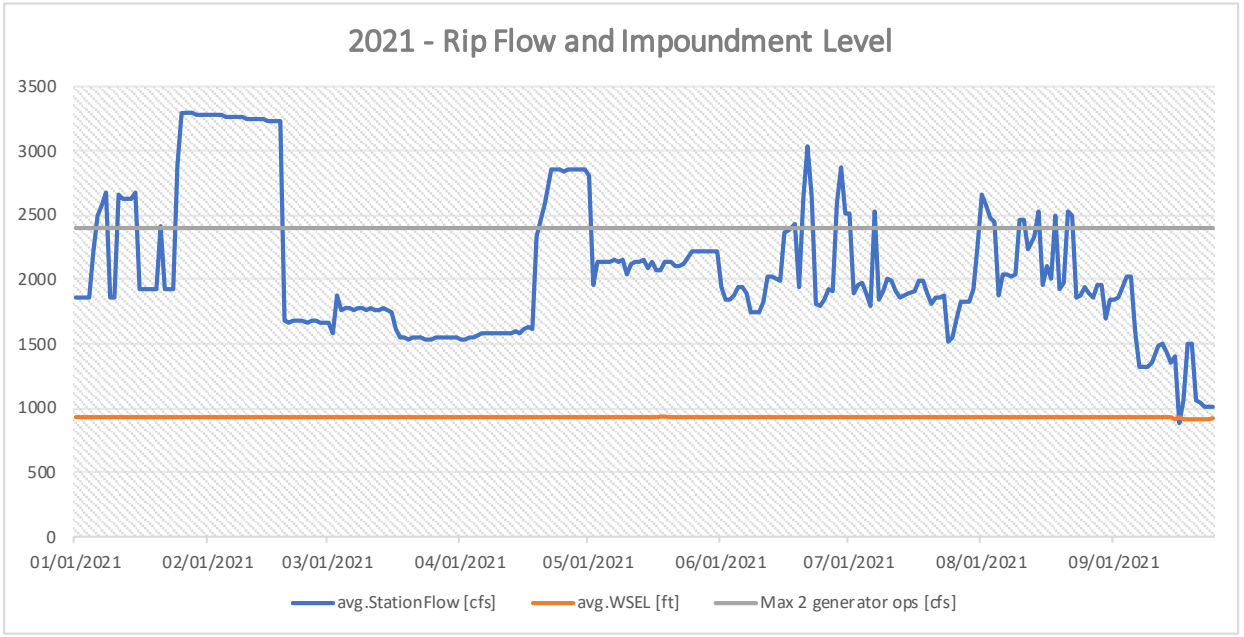
ATTACHMENT:

A - Ripogenus Flow Data and Lake Levels 2021 January to September

[17] TU letter dated May 12,2022, Subject: Maine Council of Trout Unlimited Comments on the Minimum Flow Excursion Report dated April 28, 2022 for the Ripogenus Project (P-2572).

# Attachment A

| Date | avg.Station Flow [cfs] | avg.WSEL [ft] | Max 2 generator ops [cfs] |
|---|---|---|---|
| 01/01/2021 | 1853 | 931.33 | 2400 |
| 01/02/2021 | 1855 | 931.47 | 2400 |
| 01/03/2021 | 1857 | 931.66 | 2400 |
| 01/04/2021 | 1858 | 931.75 | 2400 |
| 01/05/2021 | 2221 | 931.84 | 2400 |
| 01/06/2021 | 2501 | 931.86 | 2400 |
| 01/07/2021 | 2577 | 931.86 | 2400 |
| 01/08/2021 | 2681 | 931.79 | 2400 |
| 01/09/2021 | 1859 | 931.81 | 2400 |
| 01/10/2021 | 1858 | 931.83 | 2400 |
| 01/11/2021 | 2666 | 931.73 | 2400 |
| 01/12/2021 | 2628 | 931.66 | 2400 |
| 01/13/2021 | 2621 | 931.57 | 2400 |
| 01/14/2021 | 2630 | 931.51 | 2400 |
| 01/15/2021 | 2674 | 931.44 | 2400 |
| 01/16/2021 | 1927 | 931.26 | 2400 |
| 01/17/2021 | 1926 | 931.36 | 2400 |
| 01/18/2021 | 1924 | 931.34 | 2400 |
| 01/19/2021 | 1925 | 931.28 | 2400 |
| 01/20/2021 | 1922 | 931.19 | 2400 |
| 01/21/2021 | 2410 | 931.09 | 2400 |
| 01/22/2021 | 1925 | 931.03 | 2400 |
| 01/23/2021 | 1920 | 930.95 | 2400 |
| 01/24/2021 | 1919 | 930.91 | 2400 |
| 01/25/2021 | 2896 | 930.77 | 2400 |
| 01/26/2021 | 3294 | 930.54 | 2400 |
| 01/27/2021 | 3291 | 930.31 | 2400 |
| 01/28/2021 | 3289 | 930.07 | 2400 |
| 01/29/2021 | 3286 | 929.9 | 2400 |
| 01/30/2021 | 3284 | 929.67 | 2400 |
| 01/31/2021 | 3281 | 929.41 | 2400 |
| 02/01/2021 | 3279 | 929.14 | 2400 |
| 02/02/2021 | 3278 | 928.89 | 2400 |
| 02/03/2021 | 3274 | 928.79 | 2400 |
| 02/04/2021 | 3272 | 928.54 | 2400 |
| 02/05/2021 | 3269 | 928.24 | 2400 |
| 02/06/2021 | 3266 | 928.05 | 2400 |
| 02/07/2021 | 3264 | 927.74 | 2400 |



| | | | |
|---|---|---|---|
| 02/08/2021 | 3260 | 927.56 | 2400 |
| 02/09/2021 | 3258 | 927.23 | 2400 |
| 02/10/2021 | 3255 | 926.98 | 2400 |
| 02/11/2021 | 3252 | 926.71 | 2400 |
| 02/12/2021 | 3249 | 926.46 | 2400 |
| 02/13/2021 | 3246 | 926.17 | 2400 |
| 02/14/2021 | 3243 | 925.87 | 2400 |
| 02/15/2021 | 3239 | 925.59 | 2400 |
| 02/16/2021 | 3238 | 925.3 | 2400 |
| 02/17/2021 | 3233 | 925.16 | 2400 |
| 02/18/2021 | 3231 | 924.8 | 2400 |
| 02/19/2021 | 1679 | 924.59 | 2400 |
| 02/20/2021 | 1671 | 924.52 | 2400 |
| 02/21/2021 | 1678 | 924.44 | 2400 |
| 02/22/2021 | 1680 | 924.24 | 2400 |
| 02/23/2021 | 1674 | 924.22 | 2400 |
| 02/24/2021 | 1671 | 924.11 | 2400 |
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| 02/28/2021 | 1665 | 923.75 | 2400 |
| 03/01/2021 | 1668 | 923.57 | 2400 |
| 03/02/2021 | 1587 | 923.6 | 2400 |
| 03/03/2021 | 1883 | 923.41 | 2400 |
| 03/04/2021 | 1770 | 923.28 | 2400 |
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| 03/07/2021 | 1768 | 922.93 | 2400 |
| 03/08/2021 | 1775 | 922.78 | 2400 |
| 03/09/2021 | 1772 | 922.67 | 2400 |
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| 07/30/2021 | 1931 | 926.89 | 2400 |
| 07/31/2021 | 2271 | 926.93 | 2400 |
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| 08/03/2021 | 2475 | 926.41 | 2400 |
| 08/04/2021 | 2449 | 926.23 | 2400 |
| 08/05/2021 | 1879 | 926 | 2400 |
| 08/06/2021 | 2041 | 925.9 | 2400 |
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| 08/09/2021 | 2042 | 925.58 | 2400 |
| 08/10/2021 | 2460 | 925.34 | 2400 |
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| 08/22/2021 | 2496 | 923.67 | 2400 |
| 08/23/2021 | 1865 | 923.47 | 2400 |
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| 08/26/2021 | 1895 | 923.15 | 2400 |
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| 09/16/2021 | 884 | 921.2 | 2400 |
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| 09/20/2021 | 1060 | 920.8 | 2400 |
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| 09/22/2021 | 1005 | 920.48 | 2400 |
| 09/23/2021 | 1008 | 920.49 | 2400 |
| 09/24/2021 | 1007 | 920.44 | 2400 |

**FEDERAL ENERGY REGULATORY COMMISSION**
**Washington D.C. 20426**

**Office of Energy Projects**

Project No. 2572-136—Maine
Ripogenus Hydroelectric Project
Great Lakes Hydro America, LLC

May 26, 2022

VIA FERC Service

Kelly Maloney
Great Lakes Hydro American, LLC
150 Main Street
Lewiston, ME 04240-1398

Subject: Request for Additional Information Regarding Minimum Flow Deviations

Dear Ms. Maloney:

This letter is in reference to your April 28, 2022 filing, notifying the Federal Energy Regulatory Commission (Commission) of minimum flow deviations at the Ripogenus Hydroelectric Project No. 2572 between October 15, 2021 and April 18, 2022. Minimum flow requirements are established by Article 402 of the project license.[1] On May 10 and May 20, 2022, Mr. Ed Spear filed comments related to the deviations, as did Trout Unlimited on May 12, 2022. Mr. Spear's May 10 letter states that the low flows have affected salmon reproduction, and his May 20 letter alleges that additional deviations occurred on May 17 and 18. Trout Unlimited alleges that some of the minimum flow deviations could have been avoided by releasing less water in the months prior.

In order for Commission staff to complete our determination of your compliance with Article 402, please respond to the comments within 15 days of the date of this letter. In your response, please include hourly flow data from October 15, 2021 through April 18, 2022 as well as data from May 17 and 18, 2022. If you are unable to provide hourly data, please provide the highest resolution data available and a summary of your

[1] Order Issuing License (77 FERC ¶ 61,066), issued October 22, 1996.

flow monitoring methods.

Thank you for your cooperation. We look forward to your response, **due June 9, 2022**. If you have any questions regarding this letter, please contact me at (202) 502-8038 or alicia.burtner@ferc.gov.

Sincerely,



Alicia Burtner
Aquatic Resources Branch
Division of Hydropower Administration
and Compliance

Kimberly D. Bose May 31, 2022
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426 Via Electronic Filing

Project No. 2572-136—Comments on FERC's May 26, 2022 letter to Great Lakes Hydro America, LLC. Continuing impacts associated with violation of License Article 406 Ripogenus Hydroelectric Project

This filing is in reference to FERC's May 26, 2022 letter to the Licensee requesting addition information. In my May 10 and 22, 2022 filings the focus was on Article 406 with a nexus to Article 402 (minimum flows). The violation of article 406 continued this past week (May 22-29, 2022). Flows were reduced to 1275 CFS at 5 PM and remained at that level until around 8AM the next morning. These lower flows continued to dewater landlocked salmon (salmon) spawning, incubation and nursey areas and aquatic communities' habitat in the Holbrook Bypass and downriver areas. Although there were few anglers, fishing opportunity was also impacted.

The attached photo of the Holbrook Bypass Chanel taken on May 27, 2022 during the daily 1275 cfs flow period clearly demonstrates the impact of low flow on aquatic habitat. Despite supplemental flow from an upstream brook, Bypass Channel velocities, depths and wetted widths were significantly reduced. The area pictured would likely support some juvenile brook trout production but not the intended purpose of juvenile salmon production as proposed by MeDIFW, MeDEP and FERC. Areas of dewatered shoreline were observable in all downriver locations.

While it appears that the March, 2022 agreement between the Licensee and resource agencies legally covered spawning flows, there are no filings that deal with emerging fry and subsequent young-of-the year and juvenile salmon habitat needs. The 2021 spawning season is over, the incubation period is about to end. The March minimum flow agreement wasn't "open ended". Surely Article 406 conditions remain in effect. Daily May 2022 McKay station flow reductions down to 1275 cfs levels have seriously impacted emerging salmon and brook trout, juvenile salmon habitat and aquatic insect behavior (pre "hatch" movement or "drift") and angler activity.

May, 2022 low flows e.g., 1275, have impacted juvenile salmon habitat in all areas downstream of McKay Station. Article 406 was designed as mitigation. The goal was to produce young-of-the-year salmon in the Holbrook spawning and nursey bypass channel and as an artifact, downstream habitats. Article 406 requires a flow of 35 cfs for the period beginning June 1, continuing until October 15. At that time flows are increased to 65 cfs. McKay Station flows of 1275 makes meeting either the 35 or 65 cfs a hydraulic impossibility. This must be a continuing violation of Article 406.

The Licensee boast of various flows as Protection, Enhancement and Mitigation measures. I argue that the Licensee bears the responsibility to support its claims and remain in full compliance of all License Articles. As we move though the licensing process, FERC needs to ensure that unnecessary low flows events do not disrupt threaten angling,fish and aquatic communities.

Thank you for the opportunity to comment.

Ed Spear
307 Mt Hope Ave
Bangor, Me 04401
Email: edspear1@yahoo.com
Phone: 207-217-4288

Holbrook Bypass Channel – May 27, 2022

Commented [es1]: Ay



Brookfield Renewable

June 8, 2022

**FERC Project 2572**
**Article 402**

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

***Electronically Filed***

**Subject: Ripogenus Project, FERC No. 2572; Response to Minimum Flow Complaints**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), licensee for the Ripogenus Project (Project) located on the West Branch of the Penobscot River in Maine, submits this letter in reply to Commission correspondence dated May 26, 2022, in which the Commission requests additional information regarding complaints filed on May 12, 2022 by Mr. Stephen Heinz, writing on behalf of the Maine Council of Trout Unlimited (TU), and by Mr. Edward Spear (on May 9, 2022 and May 20, 2022). Mr. Heinz and Mr. Spear alleged that the recent low fall and winter flows at the Project represented violations of minimum flow requirements at the Project.

On May 26, 2022, the Commission requested that GLHA respond to these allegations within 15 days (or by June 9, 2022), specifically in order for the Commission to determine GLHA's compliance with minimum flow requirements for the Project contained in Article 402. The Commission also requested that GLHA include hourly flow data from October 15, 2021 through April 18, 2022, as well as data from May 17 and 18, 2022.

**Minimum flow requirements**

As detailed in GLHA's October 14, 2021 and March 10, 2022 filings with the Commission responding to previous TU complaints at the Ripogenus Project, Article 402 of the Ripogenus Project license requires that minimum whitewater recreation flows of between 1,800 and 2,300 cfs be released from the Project between 08:30 and 17:00 hrs on a daily basis between May 1st and September 15th. From September 16th through October 1st, Article 402 requires minimum whitewater recreation flows of 2,200 – 2,300 cfs, but only on weekends from 08:30 – 17:00 hrs. Between June 8 and October 14, a minimum flow of 1,000 cfs is required on days and for hours outside of these whitewater release time periods.

Article 402 of the Ripogenus Project license also states in relevant part that, "*The licensee shall release from the Ripogenus Project into the West Branch of the Penobscot River below McKay Station the following minimum flows: Salmon spawning flows of at least 1,422 cfs or inflow, but not less than 1,300 cfs, from October 15 to November 15, and salmon incubation flows greater than 1422 cfs (or the spa blished for that year) from November 16 through June 7. These flows shall be e year in consultation with the U.S. Fish and Wildlife Service and Maine Depa Fisheries and Wildlife.*" However, Article 402 also states that "*Minimum flows may be modified if required by hydrologic conditions beyond the control of the licensee, upon mutual agreement between the licensee, the U.S. Fish and Wildlife Service, DEP, LURC, and DIFW.*"

Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462
www.brookfieldrenewable.com
Tel: 207.723.4341
Fax: 207.723.3948

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Finally, Article 402 allows reduced minimum "outage" flows of 400 cfs during generating unit failures at McKay Station, and it specifies that all of the minimum flows specified in the Article *"shall be the minimum flows for each hourly period (measured on the basis of an hourly average)."*

Response to Low Flow Complaints

As detailed in GLHA's letter to the Commission dated March 9, 2022, a reduced minimum flow of 800 cfs was implemented at the Ripogenus Project on March 4, 2022 through consultation with the resource agencies[1] due to severe drought conditions in portions of the upper Penobscot River watershed. This followed the establishment (also through agency consultation) of a Project spawning and incubation flow of 1,100 cfs in October 2021 due to the drought and low water level conditions.

Although the complainants do not dispute the severe drought conditions that have plagued the upper Penobscot River drainage since 2020, they do allege that water mismanagement by GLHA (rather than hydrologic conditions) contributed to the need to reduce minimum flows at the Project. Mr. Heinz and Mr. Spear more specifically allege that GLHA mismanaged the available water storage by releasing flows from the Ripogenus Project that were higher than the required minimum flows. And since water management is within GLHA's control, the complainants argue that the minimum flow reductions were not allowed by the Project license.

While noting that the complainants have the benefit of retrospectively criticizing GLHA's water management actions (as opposed to GLHA's need to implement water management actions in real time), GLHA's water management decisions at the Ripogenus Project during the recent severe drought conditions are fully justified and entirely in compliance with the Project license. For example, while GLHA has implemented water conservation measures during the recent severe drought conditions on the Upper Penobscot drainage (including the implementation of reduced West Branch spawning and incubation flows, and by routinely reducing Ripogenus flows during non-rafting hours), GLHA must also use water stored at the Ripogenus Project to maintain compliance with its downstream Penobscot Mills Project license (FERC No. 2458), which requires both relatively stable water levels at the North Twin impoundment (from May 1 to August 22 annually) and a minimum flow of 2,000 cfs at Millinocket. And since the Ripogenus impoundment becomes the primary source of water to satisfy these downstream license requirements during drought conditions (as tributary and natural inflows dwindle), GLHA commonly releases flows from the Ripogenus Project that are in excess of minimum flows during dry and low inflow conditions.

[1] Maine Department of Inland Fisheries and Wildlife (MDIFW); United States Fish and Wildlife Service (USFWS); Maine Department of Environmental Protection (MDEP); Maine Land Use Planning Commission (MLUPC)

Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462
www.brookfieldrenewable.com
Tel: 207.723.4341
Fax: 207.723.3948

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The 1991 Water Use Plan (WUP, or Plan) referenced by the complainants was developed to support the last relicensing of both the Ripogenus and Penobscot Mills Projects, and it recognized that the numerous benefits derived from the Plan at both Projects would be provided while "*the Ripogenus impoundment would continue to be drawn down*" (i.e., the water management requirements and benefits contained in the current FERC licenses for these Projects are largely dependent on Ripogenus impoundment water). As detailed in the Plan, the WUP resulted in "*a significant re-regulation of Great Northern's entire reservoir and hydro-generation system to meet, wherever possible, the resource use and management goals identified by agencies and private groups.*" The Commission utilized the WUP in its development of the 1996 FERC licenses for the Ripogenus and Penobscot Mills Projects, and thus, the WUP is the basis for the licensed water management requirements (which are intended to balance public safety, recreational, environmental, and power generation needs) under which GLHA currently operates both Projects.

GLHA notes that while the 1991 WUP was developed to serve as a comprehensive and long-term management plan for the storage system, the WUP also did not anticipate that the subsequent (2004) FERC license for the upstream Storage Project (FERC No. 2634) would result in a substantial loss of available storage capacity in the West Branch of the Penobscot River drainage due to the following drawdown limitations:

Canada Falls Lake (0.56 billion cubic feet [bcf] lost)
Seboomook Lake (2.68 bcf lost)
Penobscot Lake (0.06 bcf lost)
Dole Pond (0.16 bcf lost)
Loon Lake (0.46 bcf lost)
Harrington Lake (0.01 bcf lost)

Additional water storage on the West Branch has been lost since 1996 with the implementation of wetlands mitigation at Umbazooksus Lake (0.45 bcf lost) and the transfer of Nesowadnehunk Lake Dam to a stakeholder (0.42 bcf lost). All told, total storage capability on the West Branch has been reduced by nearly 5 billion cubic feet since the WUP was finalized in 1991, thereby hindering WUP-based water management in the West Branch drainage.

Finally, as part of its contractual obligations with ISO – New England, GLHA is required to perform a CCA (claimed capability audit) test each summer (and once every 3 years in the winter) by maximizing generation at its facilities for short periods of time. The 2021 CCA test was performed at the Ripogenus Project on August 12, 2021, which resulted in a flow of 3,300 cfs for several hours, well above the minimum flow.

Project operational data – as requested by the Commission's May 26, 2022 letter, a table is attached that provides hourly operational flow data for the Ripogenus Project both from October 15, 2021 through April 18, 2022, and also for the May 17th and 18th, 2022 time periods. As shown by this table, GLHA released flows from the Project which for all hours exceeded the licensed minimum flows, and/or the reduced minimum flows established through agency consultation due to hydrologic conditions that resulted from the severe drought in the upper Penobscot watershed.

Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462
www.brookfieldrenewable.com
Tel: 207.723.4341
Fax: 207.723.3948

Brookfield Renewable

In summary, the complaints filed by Mr. Heinz and Mr. Spear alleging noncompliance with Article 402 of the Ripogenus Project license are without merit, as GLHA's water management actions at the Ripogenus Project during the recent severe drought conditions are fully justified and entirely in compliance with the Project license.

Please e-mail me at kevin.bernier@brookfieldrenewable.com or call me at (207) 951-5006 if you have any questions or need additional information.

Sincerely,

Kevin Bernier

Kevin Bernier
Senior Compliance Specialist

Cc: N. Stevens, J. Cole, K. Maloney, D. Heidrich, S. Michaud, S. Farrington, R. Dill, M. Osborne, T. Mapletoft, R. Dorman, L. Macomber, P. McNelis, P. Wainwright, R. Smith; GLHA
A. Burtner: FERC DHAC – Washington

GLHA File: HSSE 4a/2572/01

Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462
www.brookfieldrenewable.com
Tel: 207.723.4341
Fax: 207.723.3948

JEFF KAINE, HERMON, ME.
Good afternoon,

My comment will be short and to the point. What is going on with crazy up and down flows on the West Branch of the Penobscot River. Those poor fish donâ€™t stand a chance with the crazy fluctuations. As bad as the fish have it, the insects and other life in the river are suffering tremendously!! Iâ€™ve seen sculpins and stoneflies get trapped because of the extreme drops in flows. They all end up dying because of it, which in turn is taking food out the mouths of the fish in the river. I have noticed a decline in the fishery in recent years and I blame the extreme up and down flows. When the flows were more consistent (years past), the fishery thrived and so did any businesses along the way to the River.
Please change your policies to help the fish, the rafters, the small fish and insects and of course the businesses.

Thank you for your time,
Jeff

Brookfield Renewable

June 13, 2022

**Penobscot Mills Project**
**FERC No. 2458**

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Subject: Penobscot Mills Project (FERC No. 2458); Millinocket and East Millinocket Developments; Flow and Water Level Modifications due to Flashboard Losses and Repairs**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA) is reporting run-of-river (ROR) and water level modifications at the Penobscot Mills Project (Millinocket and East Millinocket Developments) for planned drawdowns to accommodate flashboard repairs. GLHA is the licensee for this Project, which is located on the West Branch of the Penobscot River in Maine.

**Penobscot Mills (FERC No. 2458)**

Article 403 of the Penobscot Mills license states in part that:

"*The licensee shall operate the Millinocket, Dolby, and East Millinocket developments in a run-of-river mode while providing an instantaneous minimum flow of 2,000 cubic feet per second (cfs) to the West Branch of the Penobscot River at Millinocket, for the protection of water quality and aquatic habitat in the Penobscot River. The licensee shall at all times act to minimize the fluctuation of the reservoir surface elevations by maintaining a discharge from each of these developments so that, at any point in time, flows, as measured immediately downstream from the tailraces of the developments, approximate the sum of the inflows to the project reservoir. Run-of-river operation or minimum flows may be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods upon mutual agreement between the licensee, the U.S. Fish and Wildlife Service, and the Maine DEP. If the run-of-river operation or minimum flow is so modified, the licensee shall notify the Commission as soon as possible, but no later than 10 days after each such incident*."

**Millinocket Development ROR Flow Modification, May 27, 2022 – June 3, 2022**

Through agency consultation and as detailed below and in the attached graph, the Millinocket impoundment was drawn down from May 27, 2022 to June 3, 2022 for flashboard repairs. This event resulted in a modification in ROR operations at the Millinocket Development as follows:

Start of planned drawdown to repair flashboards: May 27, 2022
Minimum impoundment level: 455.48 feet USGS (3.22 feet below full pond)
Flashboard repairs: May 31, 2022
Impoundment refilled, and ROR operations resumed: June 3, 2022

Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462
www.brookfieldrenewable.com
Tel: 207.723.4341
Fax: 207.723.3948

Brookfield Renewable

**East Millinocket Development ROR Flow Modification, May 27, 2022 – June 3, 2022**

Through agency consultation and as detailed below and in the attached graph, the East Millinocket impoundment was drawn down from May 27, 2022 to June 3, 2022 for flashboard repairs. This event resulted in a modification in ROR operations at the East Millinocket Development as follows:

Start of planned drawdown to repair flashboards: May 27, 2022
Minimum impoundment level: 282.37 feet USGS (4.83 feet below full pond)
Flashboard repairs: June 1, 2022
Impoundment refilled, and ROR operations resumed: June 3, 2022

**Conclusion**

The Penobscot Mills Project license allows flows and water levels to be temporarily modified for short periods upon mutual agreement between GLHA, the Maine Department of Environmental Protection (MDEP), and the United States Fish and Wildlife Service (USFWS). On May 26 and May 27, 2022, GLHA notified these agencies, together with the Maine Department of Inland Fisheries and Wildlife (MDIFW), the Maine Department of Marine Resources (MDMR), the U.S. Bureau of Indian Affairs (BIA), the National Marine Fisheries Service (NMFS), and the Penobscot Indian Nation (PIN), of its plans to lower the impoundments to accommodate flashboard repairs. The agencies and PIN provided no comments nor objections regarding this modification of flows and water levels at the Millinocket and East Millinocket Developments.

GLHA is not aware of any adverse impacts to fish or wildlife resources or water quality in the West Branch of the Penobscot River as the result of these water level and ROR flow modifications, and no additional incidents (safety, dam safety, public safety, security) resulted from this event.

If you have any questions, please contact me by phone at (207) 951-5006 or by e-mail at kevin.bernier@brookfieldrenewable.com.

Sincerely,

Kevin Bernier

Kevin Bernier
Senior Compliance Specialist

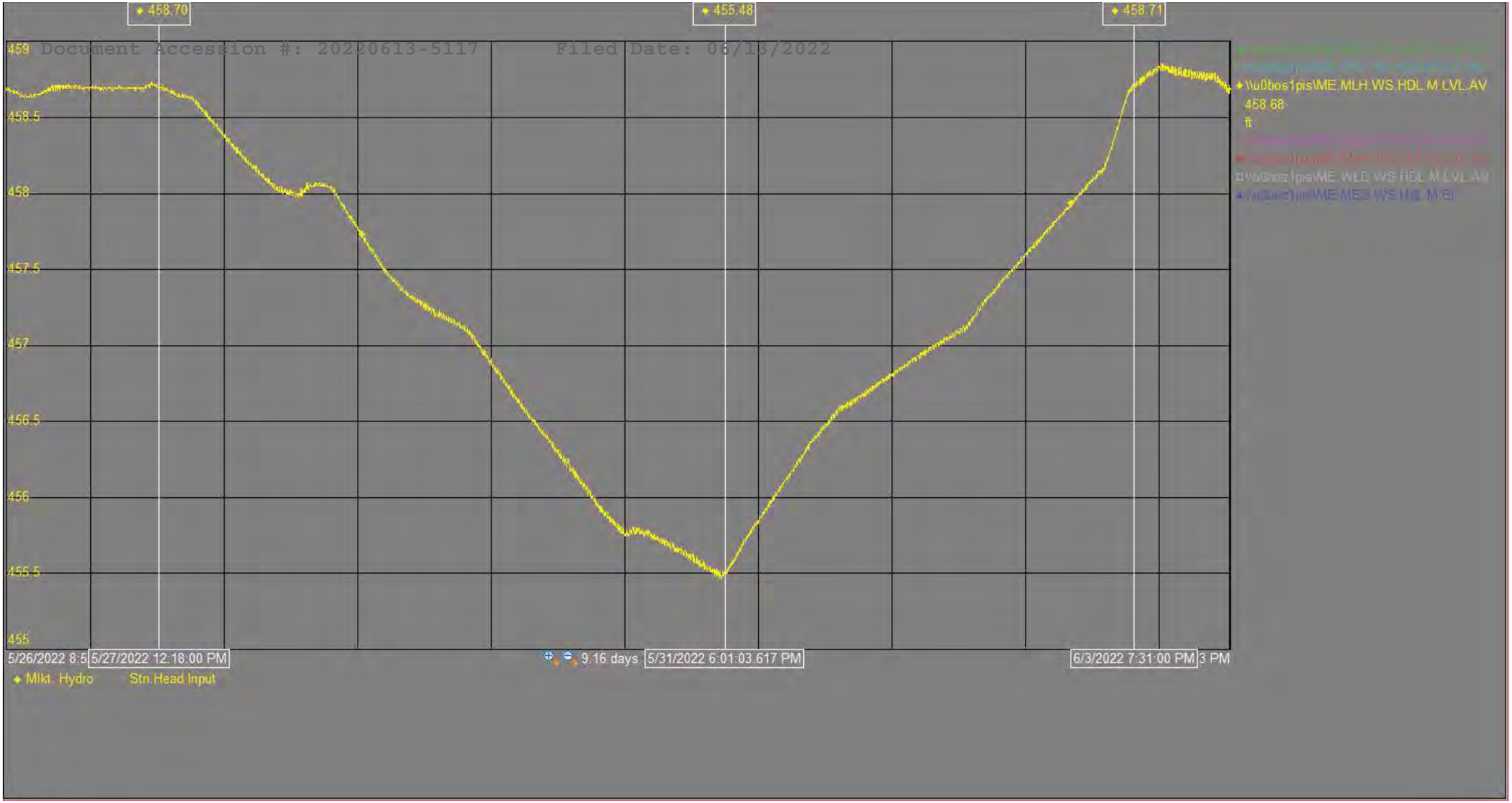
Attachments
Cc: J. Cole, K. Maloney, S. Farrington, M. Osborne, S. Michaud, D. Heidrich, N. Stevens, R. Dill, T. Mapletoft, L. Macomber, P. Wainwright, P. McNelis; GLHA
J. Perry, K. Dunham, K. Gallant, M. Caron; MDIFW
K. Olcott; MDEP
J. Murphy, D. Dow; NMFS
M. Simpson, C. Clark, S. Ledwin; MDMR
J. Rosset, A. Cross, B. Sojkowski; USFWS
D. Kusnierz, J. Mitchell, D. McCaw, C. Loring, Jr.; PIN
H. Peterson; BIA

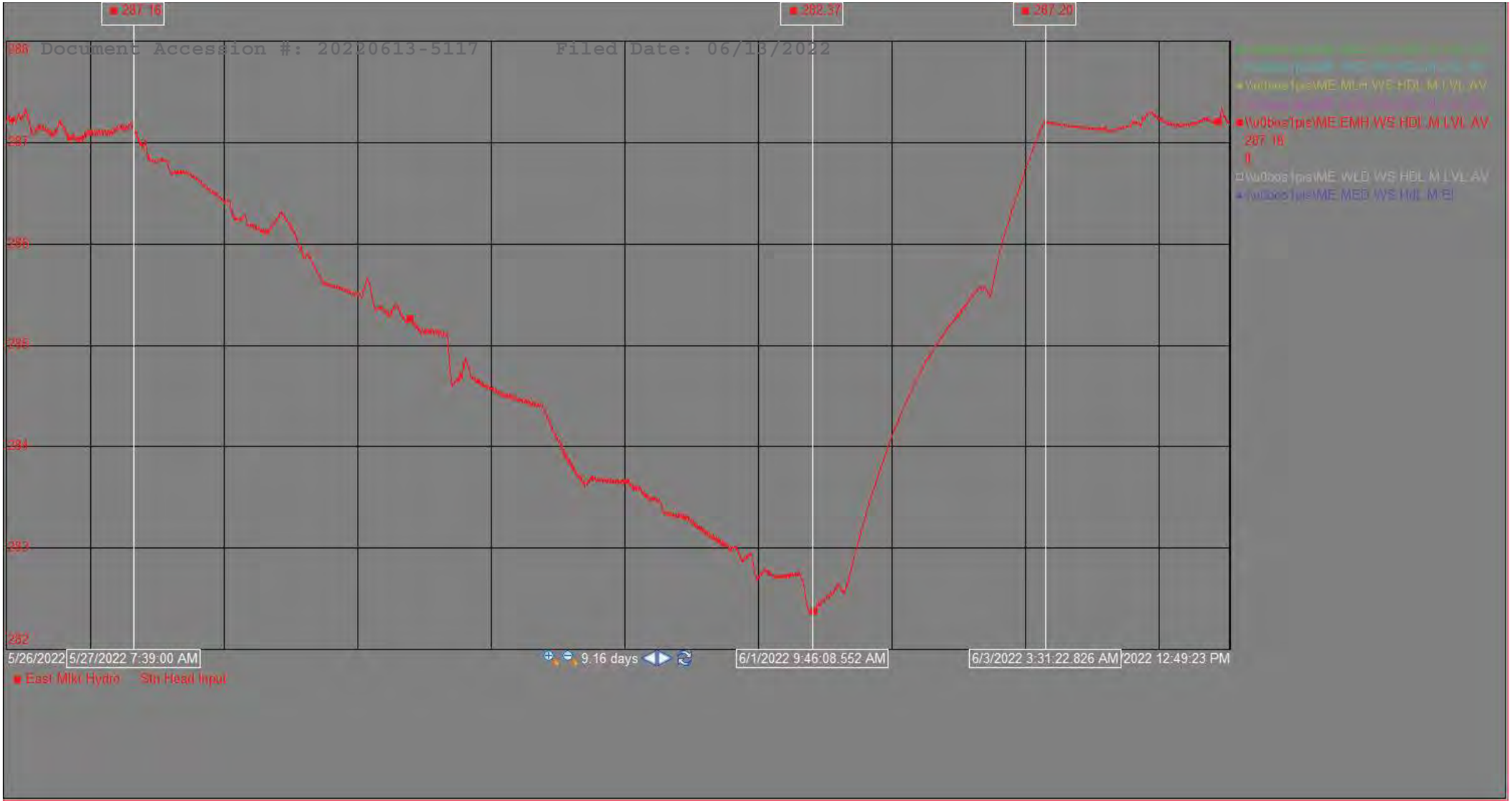
Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462
www.brookfieldrenewable.com
Tel: 207.723.4341
Fax: 207.723.3948

Brookfield Renewable

GLHA HSSE File: 19(a)(ii)

Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462
www.brookfieldrenewable.com
Tel: 207.723.4341
Fax: 207.723.3948


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2022 12:49:23 PM
East Miki Hydro
Stn Head Input

| | |
|---|---|
| **From:** | Bernier, Kevin |
| **To:** | Mark Caron (mark.caron@maine.gov); Dunham, Kevin; John Perry (john.perry@maine.gov); Jeff Murphy (Jeff.Murphy@noaa.gov); Donald Dow (Donald.Dow@noaa.gov); Daniel McCaw (dan.mccaw@penobscotnation.org); Jason Mitchell (jason.mitchell@penobscotnation.org); Mitch Simpson (Mitch.Simpson@maine.gov); Gallant, Kevin; Casey Clark (casey.clark@maine.gov); Bryan Sojkowski; Harold Peterson (harold.peterson@bia.gov); Dan Kusnierz (Dan.Kusnierz@penobscotnation.org); Olcott, Kyle; Julianne Rosset (julianne_rosset@fws.gov); Sean M Ledwin - Maine Department of Marine Resources (Sean.M.Ledwin@maine.gov); Charlie Loring, Jr.; Cross, Amanda S |
| **Cc:** | Cole, James; Osborne, Michael; Maloney, Kelly; Dill, Richard; Macomber, Lance; Heidrich, David; Dorman, Randy; Farrington, Stephen; Michaud, Steve; Mapletoft, Thomas; Stevens, Nate |
| **Subject:** | Upper Penobscot flashboard repair plans |
| **Date:** | Thursday, May 26, 2022 8:39:33 AM |
| **Attachments:** | image001.jpg |

Although elevated flows have persisted on the Upper Penobscot later than normal this year, they are now dropping, and we intend to replace flashboards at the Stone (Millinocket), Dolby, East Millinocket, Weldon (Mattaceunk), and West Enfield Dams over the next two weeks. Although I know we are entering bass spawning and loon nesting seasons, completing this work is a priority, and the sooner we can return to normal operations the better. Our current plan is to repair flashboards at Dolby tomorrow, May 27th, and then at Stone, East Millinocket, and Weldon dams next week. The West Enfield flashboard repairs are tentatively scheduled for the following week (week of June 6th). Each will require a drawdown (7.5 feet from full pond for West Enfield; 4.5 feet from full pond for Dolby, East Millinocket, and Weldon; 3 feet from full pond for the Millinocket impoundment), which would generally begin 2 – 5 days before the scheduled work in order to achieve a gradual drawdown. However, most of these impoundments have already begun to drop due to missing flashboards. I would also note that the upstream fishways at West Enfield and Weldon Dams will be temporarily dewatered during the drawdowns, which should have minimal effect on Atlantic salmon, as few if any are in the river upstream of Milford Dam (most salmon are collected at the Milford fish lift and trucked to the hatchery for broodstock). We are also making plans on how to manage upstream-migrating river herring at West Enfield as the fishway becomes dewatered.

Please let me know if you have any questions or concerns with this schedule, and I will update you if these plans change. Keep in mind that the impoundments are going to drop one way or another as river flows come down, whether we draw the impoundments down intentionally for repairs, or the ponds naturally drop due to the flows through the damaged and missing boards.

Please let me know if you have any questions, concerns, or comments regarding these drawdowns for flashboard maintenance.

**Kevin Bernier**
Senior Compliance Specialist

**Brookfield Renewable**
1024 Central Street, Millinocket, ME 04462
**C** 207 951 5006
kevin.bernier@brookfieldrenewable.com
www.brookfieldrenewable.com

| | |
|---|---|
| **From:** | Bernier, Kevin |
| **To:** | Rosset, Julianne; Peterson, Harold S; Dan McCaw; Jeff Murphy - NOAA Federal |
| **Cc:** | Mark Caron (mark.caron@maine.gov); Dunham, Kevin; John Perry (john.perry@maine.gov); Donald Dow (Donald.Dow@noaa.gov); Jason Mitchell; Mitch Simpson (Mitch.Simpson@maine.gov); Gallant, Kevin; Casey Clark (casey.clark@maine.gov); Sojkowski, Bryan; dan.kusnierz@penobscotnation.org; Olcott, Kyle; Sean M Ledwin - Maine Department of Marine Resources (Sean.M.Ledwin@maine.gov); Charlie Loring, Jr.; Cross, Amanda S; Cole, James; Osborne, Michael; Maloney, Kelly; Dill, Richard; Macomber, Lance; Heidrich, David; Dorman, Randy; Farrington, Stephen; Michaud, Steve; Mapletoft, Thomas; Stevens, Nate |
| **Subject:** | RE: Upper Penobscot flashboard repair plans |
| **Date:** | Friday, May 27, 2022 1:17:23 PM |
| **Attachments:** | image001.jpg |

In light of agency and tribal concerns and the fact that the West Enfield flashboards are in comparatively good condition and passably functioning, Brookfield will hold off on drawing the West Enfield impoundment down for flashboard repairs until sometime this summer. However, we will maintain our current plans for flashboard drawdowns at Dolby, Stone, East Millinocket, and Weldon Dams over the next week, starting with Dolby where flashboard repairs are being made today.

Jeff – in reply to your question, the upstream fishways at Weldon and at West Enfield are both substantially dewatered when the impoundments are lowered to the spillway crest elevations of each dam.

Thank you for your feedback, and please let me know if you have any additional questions, concerns, or comments regarding these drawdowns for flashboard maintenance.

**Kevin Bernier**
Senior Compliance Specialist

**Brookfield Renewable**
1024 Central Street, Millinocket, ME 04462
**C** 207 951 5006
kevin.bernier@brookfieldrenewable.com
www.brookfieldrenewable.com

This message, including any attachments, may be privileged and may contain confidential information intended only for the person(s) named above. If you are not the intended recipient or have received this message in error, please notify the sender immediately by reply email and permanently delete the original transmission from the sender, including any attachments, without making a copy. Thank you.

June 16, 2022

**FERC Project 2458**
**Article 403**

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

***Electronically Filed***

**Subject: Penobscot Mills Project, FERC No. 2458; Article 403;**
**Status Update on Corrective Actions**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), licensee for the Penobscot Mills Project (Project), submits this letter in reply to Commission correspondence dated May 17, 2022, in which the Commission requests updates on several corrective actions noted by GLHA in flow excursion reports for the Project dated September 9, September 27, September 30, and November 12, 2021, and February 14, 2022. The corrective actions, together with GLHA's status updates on these actions, are provided below:

Develop a switching procedure for isolating the battery systems and provide training on the procedure – a switching procedure for isolating the battery systems has been developed, and crew training on the procedure is scheduled for July 2022.

Repair a damaged lighting arrestor at McKay Station (part of the Ripogenus Project, FERC No. 2572) – the lightning arrestor was repaired on September 9, 2021.

Repair the hydraulic governor controls on units #6 and #8 at Dolby Station – repairs to the hydraulic controls on unit #8 at Dolby were completed on February 22. 2022. GLHA's investigation of Dolby unit #6 determined that the unit has an exciter issue (rather than a governor issue); a new exciter for the unit is on order.

Resolve an issue with the unit #7 governor system at the Millinocket Development – repairs to the governor system for unit #7 at the Millinocket Development were completed on February 23, 2022.

Please e-mail me at kevin.bernier@brookfieldrenewable.com or call me at (207) 951-5006 if you have any questions or need additional information on these corrective actions.

Sincerely,

Kevin Bernier

Kevin Bernier
Senior Compliance Specialist

Cc: N. Stevens, J. Cole, K. Maloney, D. Heidrich, S. Michaud, S. Farrington, R. Dill, M. Osborne, T. Mapletoft, R. Dorman, L. Macomber, P. McNelis, P. Wainwright; GLHA

GLHA File: HSSE 4a/2458/01

Kimberly D. Bose June 17, 2022
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426 Via Electronic Filing

Project No. 2572-136 : Ripogenus Project (P-2572) Comments On Great Lake Hydro America June 8, 2022 Response to FERC's, May 26, 2022 Request for Additional Information.

Great Lake Hydro America's (the Licensee) June 8, 2022 response is a continuation of legalese, repetition of licensing language, inclusion of irrelevant and erroneous data, and fails to address the major License issues, Article 406, raised in the May 9, 2022 and May 20, 2022 correspondence. In addition, whatever arrangement the Licensee has with ISO NE, it is subservient to its License to operate facility units at all and the environmental condition contained therein. If the Licensee believes otherwise, they should be made to prove it. If they cannot, FERC should call out this obfuscation. The following paragraphs outline the misrepresentations of facts and data related to environmental matters at hand.

Minimum Flow

While the March, 2022 emergency minimum flow of 800 cfs from McKay Station may meet 401 WQC guidelines, no end point was established. The default license requirements are that minimum flows meet the greater of predetermined flow standards or inflow. During April, inflow had increased and the impoundment was filling yet the emergency flow of 800 cfs was maintained. This and subsequent low flow events impacted salmonid spawning, incubation and juvenile salmon habitat needs as well as aquatic communities. The Licensee asserts that Article 402 conditions were met, however, Article 406 conditions were not met. The Holbrook Bypass Channel (Bypass) and well as downstream spawning and incubation areas were dewatered and salmonid and aquatic communities suffered. The violation of Article 406 is clear. Recently (May to early June 2022) the Licensee reduced McKay Station flows to 1300 cfs at 5 PM before increasing flow by 8 AM the next morning. The Bypass was not engineered to operate at a McKay Station flow of 1300 cfs, nor are salmon eggs able to abandon redds and recolonize as the channel ebbs and flows. I have seen no filing indicating the Licensee has made Bypass Chanel gate changes in an attempt to provide June 1st flow of 35 cfs to the Holbrook Bypass Channel, or if in fact, that the two pipes are capable of even providing the License requirement 35 cfs flow at 1300 cfs.

Storage Management

The Licensee states they were in full compliance of licensed flow requirements of Article 402. The issue that needs to be addressed is storage management as it relates to flow management. The Licensee argues that they were unaware of the need to conserve water while "the complainants have the benefit of retrospectively criticizing GLHA's water management". So, a company that operates the largest two storage systems in Maine states it cannot predict or monitor drainage system conditions. Really? They say this while noting "the recent severe drought conditions" and "severe drought conditions that have plagued the upper Penobscot River drainage since 2020…" Additionally, in a February 23,2022 letter (20220429-5127_2022), Mr. Kevin Bernier writes "*current and historic drought conditions in Maine, Great Lakes Hydro America, LLC (GLHA), licensee for the Storage (FERC No. 2634), Ripogenus (FERC No. 2572), and Penobscot Mills (FERC No. 2458) Projects, has been implementing water conservation measures on the Upper Penobscot since the current drought intensified beginning in 2020*". They are aware now but not then? It is left to one's imagination as how these

"conservation measures" were applied to license articles and environmental needs. The Licensee was fully aware of the need to conserve water in order to meet License requirements such as Article 406 and failed to do so.

The Preliminary Application Document (PAD) and Notice of Intent (NOI) boasts of Protection, Mitigation and Enhancement (PME) measures provided by project operations. During 2021 these measures were ignored by the Licensee. By June of 2021, inflows were low and the Ripogenus Impoundment level falling. The License has stated the Water Use Plan (Plan) does not meet current (peaking) flow objectives. However, the Licensee has now reinvented this plan and appear to use it as an excuse for its failure to meet License conditions. Had the Licensee followed the FERC approved Great North Paper's Rule Curve, or Water Use Plan or noted "local" weather forecasts, McKay Station flows could have been reduced and storage retained. Project operations are totally under the Licensee's control and the violation of Article 406 would have not occurred had the Licensee followed the FERC approved Rule Curve. The Licensee willfully used Ripogenus Impoundment Storage to meet peaking energy demands not contemplated when FERC issued the 1996 License. The Violation of Article 406 was avoidable and the responsibility lies with the Licensee. If FERC does not act, the Licensee will continue to ignore the environment. It has a strong profit motive to do so.

Water Conservation

The Licensee claim that they reduce flows following scheduled rafting releases as a water conservation measure. The boating flow requirement ends at 5PM but higher flows continue to 8 or 9 PM. It is impossible to see this action as water conservation and not peaking activity. It seems that the Licensee uses rafting/boating flows as an excuse to operate high flows during prime energy markets. This is a further contradiction as the PAD/NOI (5.3.4.1) states, regarding the West Branch, "stable year-round flows" are provided.

Facilities that fail to Provide Storage to the Ripogenus Impoundment

The "transfer of Nesowadnehunk Lake Dam to a stakeholder (0.42 bcf lost)" has nothing to do with Ripogenus Impoundment Storage shortcomings. Nesowadenhunk Stream is well downstream of McKay Station and the contribution of storage has nothing to do with the issues at hand, violations of Licensee articles and PME measures. Unless the Licensee is making a case for developing a peer-reviewed water management plan, including long abandoned small storage ponds is simply an attempt to redirect FERC's focus, a total red herring.

Upstream Storage: FERC Project No. 2634

The Licensee provides erroneous and misleading information in an attempt to obscure its failure to meet License conditions. These errors indicate a lack of understanding of 1) available water stored in the storage project 2) location of "storage ponds" that provide flows into the Ripogenus Important 3) the operation of the Storage Project i.e., "winter" drawdowns (gate settings). 4) the factual consideration of the WUP during the licensing of the Storage Project.

During the 1990s, consultants to Great Northern Paper (GNP) evaluated the contribution of water "stored" in the Storage Projects impoundments to overall mass inflow/storage. The Licensee should make this study available to FERC and the stakeholders. The study assumed that the storage Project impoundments were only of value when they "captured" or "stored" water that could not be stored in downriver locations. The GNP's consultant study of the Storage Project value found that average annual contribution was approximately 50% of storage ponds capacity. Simply, downstream capacity had to be "reached" before the Storage Project produced value. The 2021 water year demonstrates this point, the Ripogenus Impoundment never filled and

all storage Project inflow could have been captured in the Ripogenus Impoundment. As a result of the 1990s study of "upstream" storage, a number of facilities were considered *de minimus* in their storage contribution and/or not practical or cost effective. These facilities, "*Penobscot Lake (0.06 billion cubic feet [bcf]) Dole Pond (0.16 bcf), Loon Lake (0.46 bcf), Harrington Lake (0.01 bcf)"* were all scheduled for abandonment or to be turned over to third parties. As their total potential contribution is neglectable and they were originally scheduled for abandonment it is ridiculous to argue that they contributed to storage shortfalls.

More obfuscation, the Licensee claims it has lost 5 bcf as the result of Storage Project Licensing but the "numbers" don't add up. The Licensee states that 2.58 bcf of Seboomook Storage has been lost. This is simply untrue. As FERC is well aware of, "winter" gate setting protocols (normally around November 1st) are to open the facilities (deep) gates and drain all remaining storage. No storage is lost as any remaining water flows into the Ripogenus Impoundment. The Canada Falls facility (and all other facilities) operates in a similar manner and any remaining "ponded" water (Canada Falls .56 bcf) is released following winter gate setting.

The License noted in the Revised Study Plan (1-14) the "*1991 Water Use Plan is not a "management plan" consistent with other management plans, is not suited for its present management"* . In recent filings the Licensee has used the WUP as foundation for present operations. This is a contradictory, both cases can't be true. So is the WUP plan workable or archaic, a tool to be used in flow management or a prop only to be used when making legal arguments?

The Licensee, now eager to invoke the WUP, states that under the plan ""the Ripogenus impoundment would continue to be drawn down". This is correct but misrepresents the circumstances; the timing and degree of drawdown. The issues at hand are not drawdowns but the degree and timing of such events. Prior discussion of "Rule Curve" operations inherently involves drawdowns, winter drawdowns rather than July drawdowns. Thus, if the licensee is going to depend on the WUP in its defense, it should note that drawdowns under the WUP would occur in late fall and winter. This has not been the case in recent years.

The Licensee argues that the WUP was not considered in the licensing of the Storage Project. Again, this is simply incorrect. Is the Licensee suggesting that GNP was unaware that the Storage Project (P-2634) both existed and was soon to enter the licensing process? As with all other licensing events, I was present and an active participant. The Licensee's assertion is simply untrue and illogical. Storage was always GNP's major focus. GNP needed to make paper year-round. The Project License resulted in GNP maintaining much of its storage capabilities albeit, with staged drawdown. This resulted in a two-to-three-month delay in the storage arriving in the Ripogenus Impoundment and a slight loss, perhaps two feet, in McKay Station head. The delayed, slower drawdown(s) and increased minimum stream flows produced fisheries, aquatic community and angling benefits and well as boating flows.

<u>The Failure to Address Article 406 Violations</u>

Filings on May 9, 2022 and May 20, 2022 focused on the failure to provide licensed flow(s) into the Holbrook Bypass Channel (Bypass) and downstream spawning, incubation and nursey habitat. This was a clear violation of Article 406. The Licensee failed to address this concern. FERC should require the Licensee to acknowledge this, perhaps ongoing, violation and mitigate for their failure.

In summary, FERC should require the Licensee to address the violation of Article 406. FERC should also require the Licensee provide the "contractional obligation with ISO NE" it claims exist as well as the 1990s GNP evaluation of the Storage Project contribution to the West Branch/Ripogenus storage "operating budget". FERC should take action. The regulatory system cannot work without honesty and transparency. If I was not

investing my time, with my unique knowledge of historical West Branch events and facts on the ground, who would be identifying the shortcomings of the Licensee's filings?

Thank you for the opportunity to comment.

Ed Spear

307 Mt Hope Ave.
Bangor, Me  04401
Email: edspear1@yahoo.com
Phone: 207-217-4288

CC; Ms. Alicia Butner  Via Email

August 2021 Days With Releases 2964 CFS or More

| August Date | CFS Released | Day of the Week | Required Flow in a Dry Year (CFS) | Difference in CFS (required vs actual) |
|---|---|---|---|---|
| 1 | 3088 | Sunday | 2200 | +888 |
| 2 | 3106 | Monday | 2000 | +1106 |
| 3 | 3066 | Tuesday | 1800 | +1266 |
| 4 | 2946 | Wednesday | 1800 | +1146 |
| 10 | 2964 | Tuesday | 1800 | +1064 |
| 11 | 2964 | Wednesday | 1800 | +1064 |
| 12 | 3231 | Thursday | 1800 | +1431 |
| 13 | 3230 | Friday | 2000 | +2230 |
| 14 | 3227 | Saturday | 2200 | +1027 |
| 18 | 2987 | Wednesday | 1800 | +1187 |
| 21 | 3070 | Saturday | 2200 | +870 |
| 22 | 3042 | Sunday | 2200 | +842 |

Remainder of August 2021 Releases

| Date | CFS Released | Day of the Week | Required Flow in a Dry Year (CFS) | Difference in CFS (required vs actual) |
|---|---|---|---|---|
| 5 | 1890 | Thursday | 1800 | +90 |
| 6 | 2187 | Friday | 2000 | +187 |
| 7 | 2192 | Saturday | 2200 | -8 |
| 8 | 2172 | Sunday | 2200 | -28 |
| 9 | 2188 | Monday | 2000 | +188 |
| 15 | 2110 | Sunday | 2200 | -90 |
| 16 | 2290 | Monday | 2000 | +290 |
| 17 | 2145 | Tuesday | 1800 | +345 |
| 19 | 1936 | Thursday | 1800 | +136 |
| 20 | 2057 | Friday | 2000 | +57 |
| 23 | 1910 | Monday | 2000 | -90 |
| 24 | 2283 | Tuesday | 1800 | +423 |
| 25 | 2064 | Wednesday | 1800 | +264 |
| 26 | 2020 | Thursday | 1800 | +220 |
| 27 | 1934 | Friday | 2000 | -66 |
| 28 | 2172 | Saturday | 2200 | -28 |
| 29 | 2166 | Sunday | 2200 | -34 |
| 30 | 2052 | Monday | 2000 | +52 |

Ripogenus Project FERC No. 2572 FERC No. 2458

Kimberly D. Bose,
Secretary Federal Energy Regulatory Commission Penobscot Mills Project 888 First Street, N.E.
Washington, D.C. 20426

Subject: Ripogenus Project (FERC No. 2572); Penobscot Mills Project (FERC No. 2458); Minimum Flow Reductions Comments

Dear Ms. Rose,

I am writing in response to Kevin Bernier's June 8, 2022 letter regarding reduced minimum flow at the Ripogenus Project. Mr. Bernier blames the regional drought for the excessive drawdowns of 2021 which necessitated a reduced minimum flow at the project. The Operations Data provided by Brookfield indicates operations management compounded the impact of the drought.

Mr. Bernier claims whitewater requirements necessitated the releases of 2021. He states,

> "*Article 402 of the Ripogenus Project license requires that minimum whitewater recreation flows of between 1,800 and 2,300 cfs be released from the Project between 08:30 and 17:00 hrs on a daily basis between May 1st and September 15th."*

The requirements as written on the Safewaters website, are more nuanced, identifying variations for "dry" hydrologic years.

> *"Dry" hydrologic years - 2200 CFS on Saturday and Sunday; 2000 CFS on Monday and Friday; 1800 CFS Tuesday through Thursday."*

2021 was a dry hydrologic year. The attached chart, which I compiled from the Operational Data shared by Brookfield, shows daily flows throughout August of 2021 and the difference between required flow and actual flow. The chart clearly demonstrates that on 23 days more water was released than required by whitewater commitments. Twelve of these days were 842 to 2230 cfs more than required. Anecdotal data confirms many days the release went well beyond the 5:00 pm requirement, sometimes through the night. Hourly data, as requested by other agencies, would be necessary for further support.

Recognizing reducing flows during non-rafting hours would be beneficial during a severe drought, Mr. Bernier claims,

> *"GLHA has implemented water conservation measures during the recent severe drought conditions on the Upper Penobscot drainage …by routinely reducing Ripogenus flows during non-rafting hours)."*

As also shown in the attached chart, this claim is not supported by the Operational Data provided by Brookfield.

Mr. Bernier acknowledges one day of high flow as he explains Brookfield's commitment to ISO to perform a CCA test each summer,

*"The 2021 CCA test was performed at the Ripogenus Project on August 12, 2021, which resulted in a flow of 3,300 cfs for several hours, well above the minimum flow.*"

Operational Data shows a release of 3231 cfs on August 12th. It also shows releases above 3000 cfs on August 1st, 2nd, 3rd, 13th, 14th, 21st and 22nd as well. Some of these flows often lasted well beyond 5:00 pm. Again, hourly Operations Data is necessary to confirm duration of flows.

Mr. Bernier identifies downstream commitments as another reason for the dewatering of Chesuncook, Caribou and Ripogenus lakes in 2021 when he states,

*"GLHA must also use water stored at the Ripogenus Project to maintain compliance with its downstream Penobscot Mills Project license (FERC No. 2458), which requires both relatively stable water levels at the North Twin impoundment (from May 1 to August 22 annually) and a minimum flow of 2,000 cfs at Millinocket."*

If 2000 cfs is released out of North Twin, logic dictates 2000 cfs would also need to be released from Ripogenus to maintain North Twin Lake levels. Every day in August of 2021 releases from North Twin were over 2000 cfs, and more than 2000 cfs was released from Ripogenus dam all but five days.

The data provided by Brookfield, which was not available when I originally wrote in March, clearly indicates Operational Management compounded the impacts of the drought.

To analyze the impact of operations management on lake levels and energy generated, using data from the past 10 years supplied by Brookfield and FERC, I charted lake levels at the end of May, June, July and August, yearly MWH generated, average inflow at Ripogenus and hydrologic status of the given year. The following illustrates the impact of operations management.

| | May 31 lake | June 30 lake | July 31 lake | Aug 31 lake | MWH generated/avg inflow at Rip/hydrologic |
|---|---|---|---|---|---|
| 2015 | 936.33 | 936.8 | 933.48 | 931.28 | 221,914 2322. dry-avg |
| 2012 | 937.29 | 939.67 | 936.71 | 932.71 | 266,009 2377 dry-avg |
| 2020 | 939.49 | 936.07 | 931.54 | 926.71 | 242,794 2316 dry |

In all three years the average inflow at Ripogenus was very similar. However, the energy generated and impact on lake levels varied dramatically. For example, 266,009 MWH were generated in 2012, while only dropping the lake 4.58 feet. In contrast, 242,794 MWH were generated in 2020 but the lake level dropped 12.79 feet, rendering the lake 15 feet down. With only a 2.57% inflow difference, 8.73% more energy with less environmental impact was generated in 2012 than 2020. From this layperson's eyes this data seems to indicate operations management does make a difference.

Mr. Bernier states,

> *"GLHA's water management decisions at the Ripogenus Project during the recent severe drought conditions are fully justified and entirely in compliance with the Project license."*

Management decisions may comply with the license, but are they "fully justified?" The data does not indicate so. My purpose is not to chastise, or place blame. My purpose is to clarify and promote change. The devastation of 2020 and 2021 cannot happen again. It is not "fully justified." There are lessons to be learned from the 2020-2021 seasons. Lessons that can help meet the interests of all stakeholders, and provide a fair and balanced use of the water that does no harm.

Thank you for your time and consideration.

Sincerely,

Kathleen K. Houston
PO Box 145
Kingfield, ME 04947
khlally14@gmail.com

Sarah Sindo, MILLINOCKET, ME.
My name is Sarah Sindo and I am from Millinocket, ME. I am the site manager at Chewonki Big Eddy Campground, located on the West Branch of the Penobscot River. The property is about 2 miles downstream of Ripogenus Dam.
Last night, June 24, 2022, the river was scheduled to go from 3,000 cfs to 3,500 at 5pm. I read this on the SafeWaters website. Shortly after 5pm, a camper commented to me, “Wow, the river went way down!” I looked at and saw the gravel shore across the river. I came inside and checked the SafeWaters website again. The flow read 1,900 cfs.
This is one of the campground’s busiest fishing weekends of the season, and to have a 1,000+ cfs change in flow is very significant and detrimental to the fishing.
Secondly, according to the SafeWaters website, a flow of 1,900 cfs is outside of their annual release schedule. I am not sure if we are in a “normal” or “wet” hydrologic year, but with Ripogenus Lake being full, I might imagine it’s considered a “wet” year. If it is, the minimum flow on a Friday should be 2,000 cfs.
Annual Release Schedule

May 1 - September 15 between the hours of 0830 and 1700
"Normal" hydrologic year - 2300 CFS on Saturday and Sunday; 2200 CFS on Monday and Friday; 2000 CFS Tuesday through Thursday
"Wet" or "Dry" hydrologic years - 2200 CFS on Saturday and Sunday; 2000 CFS on Monday and Friday; 1800 CFS Tuesday through Thursday

We have seen fluctuating flows this spring and it has surely influenced the less than productive fishing and bug hatches.
Thank you for the opportunity to submit a comment, and I appreciate you taking the time to read my comment.
Thank you.

Julie A Puleio, BRUNSWICK, ME.
My name is Julie Puleio. I work for the Chewonki Foundation at the Big Eddy Campground campus on the West Branch of the Penobscot River.

On the Evening of Friday June 24th at 1615 Eastern Standard time the flow of the river dropped to 1921cfs. The schedule flow was due to rise to 3500cfs as of 1600EST from the daytime flow of 3000cfs. This drop in the river was greater then 1000cfs in a rapid period of time was alarming to me as I was preparing to go surfing at the high water level and quickly changed my plan not to.

Over the years we have witnessed several of these unscheduled sudden drastic drops in water flow on this river. These events impact the fishing and recreational activities and those participating. When you prepare for 3500cfs and arrive to find 1921cfs it changes everything about the way you can acsess and utilize the river from a fishing and whitewater perspective.

These dramatic fluctuations also effect the most venerable on the river, the many species of aquatic invertebrates that require the water in the river in order to live. It has been my observations over the years that these sudden drops in the river flow leave many different insects stranded on the rocks of the Big Eddy Shore.

I have photographs of the flow schedule and drop of river flow if there is an opportunity to submit I would.

Thank you for the opportunity to comment.

Paul Heinze, Bowerbank, ME.
I have been fishing the West Branch of the Penobscot for over 20 years. I have witnessed the steady deterioration of fishing quality in that time. The insect life was once prolific and the fish were strong and healthy. Over the years, the river level seems to be allowed to fluctuate more and more dramatically (high during peak demand â€“ i.e. daytime flowsâ€¦ and lower at night). The once prolific clouds of caddis hatches that used to cover my truck after a trip up the golden road are no longer. On a recent evening trip the water level was at 900. Yes, 900. This was confirmed by several folks around the Big Eddy campground who monitor for violations. The caddis flies were few and far between. Hardly any. The healthy adult salmon that were once so common on this river are now, likewise, few and far between. I believe that the caddis are critical to the ecosystem of this river and that the extreme river level fluctuations are having a very detrimental effect on the health of the caddis fly population and therefore on the health of the salmon themselves and of the salmon population. I hope that as part of relicensing a study on the impact of river fluctuation on the caddis fly (and other insect) abundance will be taken and considered.

Brookfield Renewable

July 29, 2022

*Via Electronic Filing*

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**First Study Progress Report**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), Licensee of the Ripogenus Hydroelectric Project (FERC No. 2572) and the Penobscot Mills Hydroelectric Project (FERC No. 2458) (collectively referred to as the "Projects"), herein files with the Federal Energy Regulatory Commission ("FERC" or "Commission") the First Study Progress Report for the relicensing of the Projects. The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot Counties, Maine.

The current licenses for the Projects were issued on October 22, 1996 and expire on September 30, 2026. On June 11, 2021, GLHA filed the Notices of Intent and Pre-Application Document (PAD), which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through the Commission's Integrated Licensing Process (ILP). On March 23, 2022, GLHA filed a Revised Study Plan (RSP) for the Projects and the Commission issued the Study Plan Determination (SPD) on May 13, 2022.

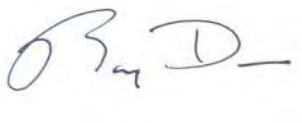
Pursuant to the RSP, GLHA herein submits the First Study Progress Report for the period from May 1, 2022 through July 31, 2022 for the Projects. The enclosed table (report) provides a list of the required studies and associated status of progress as well as any modifications to the approved methodologies.

Concurrent with this filing, GLHA is providing a copy of this letter to all parties listed in the attached distribution list. A copy of the First Study Progress Report can be downloaded from FERC's eLibrary system at https://www.ferc.gov/docs-filing/elibrary.asp by conducting a search using the docket numbers p-2458 and/or p-2572.

Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462
www.brookfieldrenewable.com
Tel: 207.723.4341
Fax: 207.723.3948

If you have any questions regarding this letter, please contact me by phone at (207) 775-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman
Licensing Manager
Brookfield Renewable

cc: Distribution List

# Ripogenus Hydroelectric Project (FERC No. 2572)
# Penobscot Mills Hydroelectric Project (FERC No. 2458)
# Distribution List

**Federal Agencies**

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Stephanie Carman
Acting District Manager
Northeastern States
Bureau of Land Management
626 E. Wisconsin Avenue, Suite 200
Milwaukee, WI 53202-4617

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Kimberly Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Deborah Szaro
New England Region 1
Regional Administrator (Acting)
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Kenneth Hogan
North Atlantic-Appalachian Region Hydropower
Program Coordinator
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03301

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

**State Agencies**

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation,
and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation,
and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation,
and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Kyle Olcott
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
101 Second Street
Hallowell, ME 04347

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Dr. Annette Padilla, PhD
Interim Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
4 Gabriel Drive, Suite 3
Augusta, ME 04330

Jeffery Gifford
State Representative
346 Frost Street
Lincoln Center, ME 04457

Peggy Jo Stanley
State Representative
413 Turnpike Road
Medway, ME 04460

**Native American Tribes**

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Marla Dana
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

**Additional Parties**

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund
sperry@maine.com

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Kelly Maloney
Manager
Great Lakes Hydro America LLC
150 Main Street
Lewiston, ME 04240

Jesika Lucarelli
Great Mountain Guide Service
greatmountaings@gmail.com

John Dicentes
President
International Association of Machinists
64 Congress Street
Millinocket, ME 04462-1312

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Director
Maine Professional River Outfitters
PO Box 669
Millinocket, ME 04462-0669

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing
mary@mxhmarketing.com

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Allison Economy
Representative for Allagash Gateway Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Thomas Nannery
Sportsman's Alliance of Maine
205 Church Hill Rd
Augusta, ME 04330-9801

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Jeffrey Reardon
Maine Brook Trout Project Director
Trout Unlimited
267 Scribner Hill Road
Manchester, ME 04351

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,
sharon.klein@maine.edu

Jeff Fayle
jfayle@gmail.com

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti
granby@cox.net

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris
nsharris@mgh.harvard.edu

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Charles Paone
cpaonejr@gmail.com

Richard Parkes
Rparkesbb3@yahoo.com

Edward Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Robert Van Deventer
bobvnert@gmail.com

Wes Zemrak
2 Brookside Drive
Falmouth, ME 04105

# FIRST STUDY PROGRESS REPORT

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>First Study Progress Report<br>(May 1, 2022 through July 31, 2022) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 1a | Water Quality Study – Impoundment Lake Trophic Assessment | Pursuant to the RSP and SPD:<br>• Impoundment water quality monitoring locations were established in late May 2022 and locations were communicated to MDEP.<br>• Routine biweekly sampling events are being performed.<br>• Data collected in 2022 will be provided in the ISR. | None. |
| 1b | Water Quality Study – Downstream DO/Water Temperature Assessment | Pursuant to the RSP and SPD:<br>• Riverine water quality monitoring locations were established in late June 2022.<br>• Routine weekly sampling events are being performed.<br>• Data collected in 2022 will be provided in the ISR. | None. |
| 1c | Water Quality – Benthic Macroinvertebrate Assessment | Pursuant to the RSP and SPD:<br>• Benthic macroinvertebrate sampling is anticipated to be performed in summer 2022.<br>• Proposed sample locations have been communicated to MDEP.<br>• Data collected in 2022 will be provided in the ISR. | None. |
| 1d | Water Quality – Impoundment Aquatic Habitat Assessment | Consistent with the RSP and SPD, the study is anticipated to be completed in 2022-2023 with data provided in the ISR. | None. |
| 1e | Water Quality – Riverine Aquatic Habitat Assessment | Consistent with the RSP and SPD, the study is anticipated to be completed in 2022-2023 with data provided in the ISR. | None. |
| 2 | Instream Flow and Habitat Assessment of West Branch below Stone Dam | Consistent with the RSP and SPD, the study is anticipated to be completed in 2022-2023 with data provided in the ISR. | None. |
| 3 | Fish Assemblage Survey Study | As required by the SPD:<br>• GLHA is developing a Fish Assemblage Survey Study Plan in consultation with the applicable resource agencies.<br>• GLHA anticipates performing the summer and fall surveys in 2022 with data provided in the ISR. | • GLHA has not yet completed consultation on the draft plan but is proposing a modified approach to sampling the Upper Gorge to reflect safety concerns. |
| 4 | Fish Stranding Study | As required by the SPD:<br>• GLHA is developing a Fish Stranding Study Plan in consultation with the applicable stakeholders. | None. |

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>First Study Progress Report<br>(May 1, 2022 through July 31, 2022) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| | | • GLHA anticipates performing the survey in mid-September 2022 (after the whitewater boating release season) with data provided in the ISR. | |
| 5 | North Twin Impoundment Tributary Access Survey | Pursuant to the RSP and SPD:<br>• GLHA developed a list of tributaries to be surveyed in consultation with MDIFW.<br>• GLHA anticipates completion of the tributary surveys in the summer and fall 2022 with data provided in the ISR. | None. |
| 6 | Upstream American Eel Passage Assessment Study | Pursuant to the RSP and SPD:<br>• GLHA initiated weekly nighttime eel observations at East Millinocket Dam in early June 2022.<br>• GLHA deployed two eel ramp traps at the toe of the East Millinocket Dam in late June 2022, which have been operational/checked weekly.<br>• GLHA initiated monthly nighttime eel electrofishing events in June 2022. Additional electrofishing events are planned for later this summer and into the fall.<br>• GLHA collected eDNA samples from the East Branch, West Branch, and mainstem Penobscot Rivers (with sample locations per the SPD communicated to the applicable resource agencies) in late July 2022.<br>• Data collected in 2022 will be provided in the ISR. | • Nighttime eel observations could not be performed in May 2022 due to spill conditions at the East Millinocket Dam.<br>• A nighttime eel electrofishing event could not safely be performed in May 2022 based on spill conditions at East Millinocket Dam and the lack of a boat barrier installed upstream of the Medway Dam. |
| 7 | Desktop Downstream Eel Passage Route and Survival Study | Consistent with the RSP and SPD, the study is anticipated to be completed in 2022-2023 with data provided in the ISR. | None. |
| 8 | Recreation Study | Pursuant to the RSP and SPD:<br>• GLHA installed survey boxes (and established an electronic survey) at the FERC-approved Project recreation sites as well as two additional locations that are used to access the remote campsites on Ripogenus impoundment in early May 2022.<br>• Since May 2022, GLHA has performed twice monthly recreation spot counts and calibration counts at the Project recreation sites. | None. |

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>First Study Progress Report<br>(May 1, 2022 through July 31, 2022) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| | | • GLHA anticipates completion of the recreation site inventory in the summer of 2022.<br>• Data collected in 2022-2023 will be provided in the ISR. | |
| 9 | Whitewater Boating Assessment Study | Pursuant to the RSP and SPD:<br>• GLHA installed whitewater interview sign-up card boxes at several whitewater put-in and take-out locations at the Projects.<br>• GLHA is interviewing whitewater boaters and interviews will continue into the fall 2022.<br>• Data collected in 2022-2023 will be provided in the ISR. | None. |
| 10 | Aesthetic Study | Pursuant to the RSP and SPD:<br>• GLHA established KOPs and initiated photo-documentation of views from each KOP in late June 2022.<br>• Data collected in 2022-2023 will be provided in the ISR. | None. |
| 11 | Historic Architectural Survey | Consistent with the RSP and SPD, the study is anticipated to be completed in 2022-2023 with data provided in the ISR. | None. |
| 12 | Historical Operations Data Assessment Study | Consistent with the RSP and SPD, the study is anticipated to be completed in 2022-2023 with data provided in the ISR. | None. |
| 13 | Operations Model Study | Consistent with the RSP and SPD:<br>• GLHA is in the process of developing and calibrating the operations model.<br>• GLHA anticipates consultation with interested stakeholders to discuss the model input data and calibration in 2022 or early 2023.<br>• The model input data and calibration data will be provided in the ISR. | None. |
| 14 | Wood Turtle Habitat and Presence Evaluation Study | Consistent with the RSP and SPD:<br>• The study will be initiated in 2022 in consultation with the MDIFW.<br>• Data collected in 2022-2023 will be provided in the ISR. | None. |
| 15 | Marsh Bird Survey Study | Consistent with the RSP and SPD:<br>• The study will be initiated in 2022 in consultation with the MDIFW.<br>• Data collected in 2022-2023 will be provided in the ISR. | None. |

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>First Study Progress Report<br>(May 1, 2022 through July 31, 2022) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| | | • If deemed necessary, field surveys will be performed between May 15 and June 30, 2023 with data provided in the USR filed with FERC in May 2024. | |
| 16 | Furbearer Survey Study | Consistent with the RSP and SPD, the study is anticipated to be completed in 2022-2023 (in consultation with MDIFW) with data provided in the ISR. | None. |
| 17 | Common Loon Management Plan Assessment Study | Consistent with the RSP and SPD, the study is anticipated to be completed in 2022-2023 with data provided in the ISR. | None. |
| 18 | Riparian and Littoral Habitat Assessment Study | Consistent with the RSP and SPD, the study is anticipated to be completed in 2022-2023 with data provided in the ISR. | None. |
| 19 | Terrestrial, Botanical and Wildlife Resources Study | Consistent with the RSP and SPD, the study is anticipated to be completed in 2022-2023 with data provided in the ISR. | None. |
| 20 | Environmental Justice Study | Consistent with the RSP and SPD, the study is anticipated to be completed in 2022-2023 with data provided in the ISR. | None. |

Kimberly D. Bose September 21, 2022
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426 Via Electronic Filing
.

Project No. 2572-136 : Ripogenus Project, Comments On Great Lake Hydro America's September 15, 2022 Draft Fish Stranding Study Plans.

The proposed stranding study is intended to meet a Trout Unlimited (TU) concern with salmonid and macroinvertebrate stranding during emergency McKay Station (McKay) outages in the West Branch of the Penobscot River (West Branch). On February 21, 2022 TU filed the study request. TU's concerns are based on angler and boater's observations of salmonids and macro invertebrates stranded during emergency McKay outages. While strandings were only observed during the recreational season, May through October, McKay Station outages have been documented over the course of a year.

I am including addition historic information on sudden shutdowns of McKay Station. During the 1960s and 1970s I fished the West Branch downstream of McKay. At that time Great Northern Paper had a labor contract that required three day holidays (July 4th, Labor Day) and the Mill's paper production paused. Hydro power was not needed and McKay Station generation ceased. Base flows, typical around 2500 cfs abruptly stopped, and flow into the West Branch was though the Rip Dam deep gate, typical around 400 cfs. The sudden unramped flow resulted in stranded aquatic insects, dead or moribund aquatic insects were abundant in small pools, ledge, crevices, and rocky outcroppings. Insect (survivors) drift increased and the fish fed heavily and the fishing was spectacular (and is recorded in creel survey data collected by MeDIFW's Paul Johnson). It is likely that emergency McKay shut downs produce similar increase aquatic insect drift and stranding. Drift nets,

possibly located at Holbrook Pool, set and tended before, during and after outage flow would enhance the proposed stranding study.

Having reviewed Great Lake Hydro America's (the Licensee) September 15, 2022 draft study plans, I find the plan totally inadequate. As presented, the proposed study lacks insight into 1) fish behavior, 2) biological information contained in the 1992 FERC Application 3) hydrology, 4) study goals and 5) any possible successful outcome for useful information as the study is presently presented. I suggest that any fish stranding study be postponed until both biological and sampling conditions and protocols can be defined.

Fish Behavior; While all fish and macro invertebrate species and life stages have some vulnerability to stranding, it is the younger and smaller salmonid life stages and all macroinvertebrates that are most vulnerable to project operations. The Licensee's draft study fails to quantify let alone account for peak (seasonal) salmonid and macro invertrabrate vulnerability. A study conducted in October as fish and aquatic communities seek "winter" shelter fails to address behavior/habitat selection during the "spring-summer" growing season.

Juvenile salmon, namely fry, are most vulnerable during their first months of life, as they grow during the summer, they seek deeper areas with higher water velocities. More importantly, as water temperatures cool, typically below 50 f (10 c) they seek refuge in the interstices formed by large gravels and rocks and become more nocturnal. Heggenes (1990), Fraser et al. 1993, Gibson (1978), Heggenes, and Dokk,, (2001), reported behavior changes as water temperatures declined while Saltveit, et al. (2001) studied the salmon parr vulnerability to stranding as water temperatures dropped and behavior changed in a regulated stream and reported an increased winter mortality. Heggenes et al (2006) reported behavioral and habitat selection in response to

water temperature changes in a stream with “young salmon” and brown trout.

Biological Information; The 1992 License Application documents Landlocked salmon (salmon) habitat by life stages and river section(s). These data were based on electrofishing and angler surveys. Licensee has stated that these data are valid, no new information is needed. Yet the Licensee apparently has not reviewed the 1992 Application as it has proposed study locations NOT supported by 10-12 years of West Branch fisheries field work. The study plans (Methods 5) states the sampling areas will be areas “which are accessible, heavily fished, and known to provide habitat for cold water salmonids”. While the Big Eddy was once famous, the Licensee should provide current information to demonstrate current angler activity and presence of target species and life stages in the Telos Bridge and Nesowadnehunk Deadwater reaches. Collectively the three study sites presented in the draft plan make no sense as they sample areas where young-of-the-year salmon are known not to exist. Locations that should be sampled are areas that are known to contain habitat suitable for YOY salmon and (to a lesser degree) parr, macroinvertebrates AND where these habitats are vulnerable to outage flows. The idea that Nesowadnehunk Deadwater contains fry and parr habitat is absurd. The proposal to evaluated the Big Eddy is less far-fetched as parr are found in the high velocity area at the head of the pool and the shallower lower end of the pool. As with Nesowadenhunk Deadwater, the moderately deep Big Eddy is NOT Representative of areas where juvenile salmonids and riffle/run macro invertrabrates are present and subject to dewatering. (The Big Eddy contains some aquatic insect species

that prefer deeper/slower flows as well as receiving upstream insect drift). The Telos Bridge area has been subject to unnatural modification (log driving) and is high velocity featuring ledge and boulder substrates. This reach lacks velocity/depth/substrates that support YOY salmon production.

The February 21, 2022 TU filing states " impacts of "*generator outage flow*" on aquatic organisms." At this time, macro invertrabrates are strangely omitted from the study plan. Should macro invertrabrates be included, none of the proposed study reaches provide riffle/run areas that would be considered classic macroinvertebrate production areas for the species of Ephemeroptera, Plecoptera, Trichoptera that favor these habitats in the West Branch. Presentive areas include Holbrook Pool, the Horserace, and several side channels.

Hydrology: The Licensee fails to mention or perhaps understand West Branch flow dynamics. During an outage, flow drops over time and distance. However, the starting point flow (the McKay flow at the time of outage) is unknown for historical outages or for the proposed study. The drop in water surface elevation at various river reaches will depend on the base flow, channel configuration and travel time. Thus, several outage events, each with different initial base flow e.g. 2000 cfs, 2500 cfs, 3000 cfs, etc. are needed to demonstrate the degree of stranding.

The Holbrook bypass channel (Article 406) is a major component of mitigation measures required by the 1996 license. The goal of watering a dewatered side channel was the production of juvenile salmon. This was accomplished by creating a spawning, incubation, and nursey habitat by providing suitable flows. Flow is provided by two gates that are hydraulically controlled by the water surface elevation at Holbrook Pool. As flow into the bypass channel is a product of river flow and elevation, the relatively shallow bypass is extremely sensitive to any flow changes. Outage flows have to

potential to eliminate several salmon year classes and requires study. This oversight must be corrected.

Study goals: The draft study plan fails to mention macro invertebrates. These guilds, mayflies, stoneflies, caddis flies, crayfish, leeches, etc. provide the critical food source for juvenile and sub adult salmonids and a summer maintenance diet of adult salmon. These guilds are less mobile, thus more vulnerable to outages and stranding. This oversight needs to be corrected.

Study Results: As proposed, the draft study plan will produce little useful information. Even with the use of drones, searching for stranding in a large pool and a deadwater known for their lack of YOY salmon and few parr during a time period (October) when these life stages may have “retreated” into winter habitat is largely meaningless. If there are few or no target fish then the results are a forgone conclusion; no stranding!!!

The failure to include macro invertrabrates and the Holbrook Bypass Channel is a mystery. These two omissions fail to meet TU’s very reasonable February 15, 2022 request. The proposed study sites are not presentative of river reaches where significant stranding could occur.

I urge the Licensee to rethink the study and reschedule the “fish stranding study” for a period e.g., July, when juvenile salmonids and macro invertrabrates would be most vulnerable to stranding. The present study plans will not meet TU well thought-out goals.

Thank you for the opportunity to comment.

Ed Spear
307 Mt Hope Ave
Bangor, Me 04401
Phone 207-217-4288

Email: edspear1@yahoo.com

Literature cited

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Gibson John R, **The Behavior of Juvenile Atlantic Salmon (Salmo salar) and Brook Trout (Salvelinus fontinalis) with Regard to Temperature and to Water Velocity** Transactions of the American Fisheries Society 1978 Volume 107, Issue 5

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Saltveit,S.J, J.H. Halleraker, J.V. Arnekleiv, A. Harby. **Field experiments on stranding in juvenile atlantic salmon (*Salmo salar*) and brown trout (*Salmo trutta*) during rapid flow decreases caused by hydropeaking**.Regulated Rivers: Research & Management September 2001,Volume 17, Issue 4-5

Todd Mercer, Poland, ME.
I have worked both as a raft guide and a fishing guide for the past 26 years on the west branch of the Penobscot River. I have watched as the water management practices have changed in the last couple of years, and I wanted to take a moment to explain my concerns. Understand Rip Dam is due for relicensing and this is our opportunity to comment regarding Brookfields practices and management of the watershed.

For many years the W.B. Penobscot water was managed with the health of the wildlife in mind. Water levels were stable, day and night for long periods of time. This allowed insects, fish, loons, eagles and osprey to flourish within the region.

I understand that once upon a time, the power ran the mill in town, so power 24 hours a day made sense. Now that Brookfield is selling power back to the grid, things are changing for the benefit of the company. During the last two seasons Brookfield has begun to manage the water levels much more like the Kennebec River. Running water during the day when prices are advantageous, and dropping water levels at night, when prices are low. Thus conserving the money making resource for peak pricing. This makes perfect sense to anyone who is thinking about how to to make money off the facility.

Unfortunately, the W.B. Penobscot is not like the Kennebec River. The Kennebec is a deep, high volume river which runs through a narrow gorge. The W.B. Penobscot, is a shallow river with some fast rapids, with long slower pools in between. When Brookfield drops the water from 2500cfs during the day, to 1400cfs in the evening, they are exposing the bottom of the river (10 to 20 feet of beach front at Big Eddy) where the larva and pupa stages of the insect life, they support and feed the fish within the river system, are living. We have seen a noticeable decline on the number of caddis available along the river over the past couple of years. If we continue to slaughter our insect life each evening, there will not be enough feed for the fish.

Of greater concern, are nesting loons. Each year there is at least one pair of nesting loons on the Nesowednehunk Deadwater. There is another pair on the Abol dead water. I cannot say for certain, but there is likely other pairings between Big Poc and Ambajejus. When the water drops, this also impacts Compass Pond and River Pond.

These wild swings in water levels leave loon nest stranded a long ways from the water. As most people know, loons are not adept at walking on land, and quickly abandon a nest they cannot get to them.

I recently learned of a study Brookfield is conducting on October 5, where they will drop the river to 400cfs to see observe the impact, and possibility of fish strandings. Right across from McKay station, there is a pool that will trap a large number of fish. I have not counted them when I have seen the water down, but I'm not talking about 5-10, it's more like 50-100.

If Brookfield is allowed to drop the river the 400cfs each night, it will decimate the river ecology.

I am asking that, as a condition of the renewed license, Brookfield be required to maintain the traditional consistent water level practices, rather than dropping the water at night. For the health of the entire eco system, including protected species like the Common Loon and the Balk Eagle, the water level is of vital importance.

Thank You for your time and consideration,

Todd Mercer
Poland, ME

Jeffrey Scott Murphy, Orono, ME.
On September 22, 2022, Great Lakes Hydro America, LLC (GLHA) provided a draft fish stranding survey study plan for review and comment. The stranding study was required by the Commission in the May 13, 2022 Study Plan Determination for the Ripogenus Project. The study was required to "provide a mechanism to evaluate the potential for, and magnitude of, fish and invertebrate stranding during generator shutdowns." The results of the study "could inform the development of license requirements for emergency minimum flows and the rate at which downstream flows are increased or decreased, if necessary [section 5.9(b)(5)]." While the Applicant was not required by the Commission to consult with the National Marine Fisheries Service in the development of this plan, we offer the following comments for your consideration.

As currently written, the proposed study plan will not achieve the objectives of the Commission's study plan determination. First, the proposed study ignores all areas of riffle, run, and braided channel habitat in the West Branch of the Penobscot River from McKay Station downstream to Nesowadnehunk Falls that will be most impacted by generator shutdowns at McKay Station. The Applicant proposes to survey two large pools (Big Eddy and Nesowadnehunk Pool) and below the Telos Bridge which they fully understand will be less affected by generator shutdowns. Second, the proposed study will not provide any data concerning the effects of generator shutdowns on non-mobile and limited-mobile lifestages of fish (eggs and fry) or any data on stranded macroinvertebrates at all. The Applicant proposes to conduct the study in October, 2022 when these lifestages of fish are absent in the West Branch of the Penobscot River. Lastly, the Applicant does not propose to collect any data on macroinvertebrates insects or mussels.

In summary, the draft study plan is wholly inadequate to meet the goals of the Commission's study plan determination and requires significant revision and stakeholder engagement to formulate a suitable plan.

Thank you, Jeff Murphy. National Marine Fisheries Service. Maine Field Station.

September 23, 2022

Ms. Kimberly D. Bose
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Via online submission to: http://www/ferc.gov**

Subject: **Comments of Maine Council of Trout Unlimited on the Draft Fish Stranding Study Plan**

Dear Secretary Bose:

On behalf of its six chapters and over 2,000 members, Maine Council of Trout Unlimited (TU) submits these comments as a matter of record regarding the Draft Fish Stranding Study Plan (Plan) for the Ripogenus Project (P-2572) submitted late on September 13, 2022, announcing that the study would be conducted on October 5 and that comments were due "at your earliest convenience or by September 27, 2022."[1] This was in response to the FERC Study Plan Determination (SPD) that had been issued back on May 13, 2022. TU appreciates the opportunity to comment. We have included the Plan for FERC Staff convenience as Attachment A.

In the SPD, FERC Staff stated:

"Rapid changes in flow and decreases in water surface elevation can increase the risk of fish and invertebrate stranding which may be stressful and/or lethal for aquatic organisms."[2]

The SPD went on to say:

"The potential effects of reduced flows and flow fluctuations are likely to extend, at a minimum, to the nearest large, downstream pool. Therefore, we recommend GLHA conduct the Fish Stranding Study requested by Maine TU, through the area from McKay Station downstream to Nesowadnehunk Falls."[3]

It has been shown that fish and macro-invertebrate strandings occur during generator trip events. TU documented this during the August-September timeframe of 2021 when strandings were photographically documented.[4] The Brookfield Plan will not meet the study goal: "to determine the extent and degree of danger stranding pools that occur from below the McKay Station discharge to Nesowadnehunk Falls, especially under 400 cfs generator trip events" as stated in TU's formal FERC Study Request[5] provided as Attachment B. The Plan will not inform the relicensing process, and in its

[1] Email from Cate Russell HDR, Subject - Ripogenus Project: Draft Fish Stranding Study Plan, September 13, 2022 at 5:04 p.m.
[2] Study Plan Determination for the Ripogenus Hydroelectric Project and the Penobscot Mills Hydroelectric Project dated May 13, 2022, page B-5.
[3] Id., pages B-5 and B-6.
[4] TU Letter dated September 21, 2021, Subject: Maine Council of Trout Unlimited Report of Observed Low Flow Events for the Ripogenus Project (P-2572); TU Letter dated January 5, 2022, Subject: Maine Council of Trout Unlimited Amplifying Report for Observed Low Flow Events for the Ripogenus Project (P-2572).
[5] SPD, page B-4 and subsequent.

present form, the Plan has the potential to misinform the relicensing process by generating erroneous and inadequate study results by attempting to locate stranded fish in areas where they are unlikely to be stranded using methods that will likely fail to locate stranded fish.

**Plan Deficiencies**

Study Areas

The most significant deficiency is the plan's selection of study areas. Two of the three areas indicated the Big Eddy and Nesowadnehunk Deadwater[6] are deep pools where it highly unlikely strandings will occur. As written, the plan is likely to return data indicating that stranding is not occurring, or is not occurring in significant enough numbers of occasions to warrant concern.

While the Plan covers the area by Telos Bridge where TU documented the stranding in 2021, it does not include the area of greatest fisheries interest, the Holbrook bypass spawning and rearing area, or the area with the greatest stranding potential Big Ambejackmockamus Falls. As quoted above, the study was to include areas of stranding possibility between McKay Station and Nesowadnehunk Falls, TU sees no benefit to looking for stranded fish in deep pools where there is minimal stranding potential, TU does not see stranding potential in the Little Eddy, Nesowadnehunk Deadwater, or upstream in the gorge above McKay Station. The remaining waters should be covered including the small side-channels on the south bank below Little Ambejackmockamus Falls. If conducted as stated in the Plan, while there is inadequate information to compute a precise percentage, an eyeball estimate is that the study would devote over 95% of its effort to areas not expected to contain stranded fish. Besides the area below Telos Bridge where the stranding was photographed, north bank just below Telos Bridge, the side channel of the island immediately downstream should also receive special attention. Attachment C map is provided to show the study areas.

Brookfield states that TU indicates in recent letters that strandings occur in large pools during trip events.[7] TU is unaware of making such a statement and Brookfield does not include a citation.

Documentation/Data Collection

Nearly equally deficient in Brookfield's plan is the use of drones and boats to find trapped fish.[8] Fish are extremely difficult to spot in Maine's tannin-stained waters, even when wading. The photo series provided when documenting the fish stranding in 2021[9] makes this very clear and is provided as Attachment D. The study can only be conducted using 'boots on the ground.' It should be recognized that boats may be of some use in transporting field crews to the heads or tails of pools, or getting field crews to the north bank south of the Big Eddy.

[6] Draft Stranding Study Plan, page 3, Figure 1.
[7] Id., page 2.
[8] Id., page 4.
[9] TU Letter dated January 5, 2022, Subject: Maine Council of Trout Unlimited Amplifying Report for Observed Low Flow Events for the Ripogenus Project (P-2572), pages 3 through 5.

Rough examination of the productive study areas described above shows the distance from the tail of the Little Eddy to the head of the Big Eddy to be less than a mile, the Holbrook side channel less than a quarter of a mile, the island backchannel, a quarter of a mile, small side-channels on the south bank below Little Ambejackmockamus Falls less than a quarter of a mile, and from the tail of the Big Eddy to the head of the Nesowadnehunk Deadwater a little less than 3.5 miles – this totals to about 5 river miles more or less. At least a 20-member field crew would be required to cover both sides of a half mile stretch of river during a during a nominal 2-hour trip event given the large amount of dewatered area and the rocky, slippery conditions that will prevail. It will be important for the members of the field crew to document what areas they actually covered during the outage period to determine the magnitude of the strandings. Should a shorter outage period be used, a larger field crew would be required.

Duration of the Trip Event

The Plan states regarding duration: "The simulation event will be modeled after a "typical" station trip event identified from the 5-year operational data review (2018 – 2022)."[10] This time period was not specified in the draft plan and is an important omission. Minimum time to bring a crew in from Millinocket to effect restoral of previous flow levels is over an hour even under the new protocols. Accordingly, the duration of the event should be no less than two hours. Though also unspecified, we assume that the flows prior to the trip event would be the average summer daytime flows of 2200 cfs.

Macro-invertebrates

The TU formal FERC Study Request for Fish Stranding evaluation did not provide for documentation of stranded macro-invertebrates that are expected to be present in significant numbers. These were reported in the same filing as the fish stranding in 2021.[11] FERC recognized the importance of macro-invertebrates in its SPD.[12] Documenting macro-invertebrates during the course of the stranding study would be an excellent opportunity to assess project potential for the stranding of macroinvertebrate. Therefore, we ask that the Plan include data collection on stranded macroinvertebrates as well.

**Additional Information**

The stranding study should not be conducted in the fall after October 14 to avoid affecting salmonid spawning activities. This is consistent with project minimum flow requirements.[13]

[10] Id., page 2.
[11] TU Letter dated September 21, 2021, Subject: Maine Council of Trout Unlimited Report of Observed Low Flow Events for the Ripogenus Project (P-2572); TU Letter dated January 5, 2022, Subject: Maine Council of Trout Unlimited Amplifying Report for Observed Low Flow Events for the Ripogenus Project (P-2572).
[12] SPD, page B-5: "Accompanying field surveys, developed in consultation with Maine TU and Maine DIFW, would provide a mechanism to evaluate the potential for, and magnitude of, fish and invertebrate stranding during generator shutdowns. Collectively, these results could inform the development of license requirements for emergency minimum flows and the rate at which downstream flows are increased or decreased, if necessary [section 5.9(b)(5)]."
[13] PAD, page 4-45, Table4.4-1.

"Pursuant to section 5.15(c)(1) of the Commission's regulations, the initial study report for all studies in the approved study plan must be filed by May 13, 2023."[14]

**Point of Clarification**

The Plan shows the event commencing at 9:30 on October 5, 2022. We ask that Brookfield confirm that this is the time that the trip event will be initiated reducing the flow from McKay Station to 400 cfs and not just a reference schedule time. If TU is able to obtain volunteer observers for the event on October 5 on short notice, should it not be conducted, TU would like to be able to inform those volunteers and avoid unnecessary travel to the site. If Brookfield is unable or uncertain as to its ability to field the resources required to conduct the event, then Brookfield should announce that no later than 9:30 on Saturday, October 1. TU has expedited its review of the Plan as requested by Brookfield. We ask that Brookfield reciprocate the courtesy should the event not occur as specified in the Plan.

**Other Stakeholder Comments**

TU appreciates the email comment of MDIFW supporting inclusion of the Holbrook side channel in the study.[15]

**Conclusion**

Unless the measures contained in these comments regarding study areas, documentation/data collection and duration of the trip event are implemented by the stranding study, Brookfield will have failed to comply with the FERC Study Plan Determination.

Respectfully,



Stephen G. Heinz
Maine TU Council FERC Coordinator

Electronic copies to: Cate Russell, HDR; Alicia Burtner, FERC Compliance

[14] SPD., page 3.
[15] MDIFW Fisheries Biologist Tim Obrey email of September 19, 2022, RE: Ripogenus Project: Draft Fish Stranding Study Plan: "We would like to add the Holbrook back-channel to the study sites."

Attachments:

A – Brookfield Draft Stranding Study Plan

B – TU Stranding Evaluation Study Request

C – TU Proposed Study Area Map

D – Stranding Photo Sequence

# Attachment A

**Draft Fish Stranding Study Plan – Ripogenus Project**

## 1.0 Requested Studies

In their Study Plan Determination (SPD)[1] for the Ripogenus Project, the Federal Energy Regulatory Commission (FERC) recommended that Great Lakes Hydro America, LLC (GLHA) study the existing emergency outage flow protocol during a station trip to assess whether it results in fish becoming stranded in pool habitat between McKay Station and Nesowadnehunk Falls. The study was originally requested by Trout Unlimited (TU). In their February 21, 2022, letter to FERC, TU requested that GLHA perform a flow demonstration study to assess whether the outage flow results in stranding of fish in pool habitats between McKay Station and Nesowadnehunk Falls. TU noted that:

> *The study will provide information regarding the potential for fish stranding associated with the Ripogenus Project. The study objective is to determine the extent and degree of danger stranding pools that occur from below the McKay Station discharge to Nesowadnehunk Falls, especially under 400 cfs generator trip events.*

TU and FERC also requested that GLHA perform a desktop evaluation to collect information about station trip events. This information is intended to identify specific conditions that lead to occasional unit shutdowns and resulting periods of low flow releases into the West Branch of the Penobscot River.

## 2.0 Resource Management Goals

The Maine Department of Inland Fisheries and Wildlife (MDIFW) manages the West Branch of the Penobscot River downstream of McKay Station and its tributaries to provide high quality habitat for spawning, nursery, and adult lifestages of a variety of fish species. The reach is especially suitable for landlocked salmon and brook trout; fluvial and lacustrine mesohabitats (including large deadwater areas and pools) provide habitat for spawning, juvenile, and adult lifestages of landlocked salmon and brook trout, as well as various other native and non-native species.

## 3.0 Study Area

As described in the SPD and in TU's request, the study area for the fish standing assessment includes the West Branch of the Penobscot River between McKay Station and Nesowadnehunk Falls.

[1] Issued by FERC on May 13, 2022.

## 4.0 Background

If unplanned conditions cause McKay Station to trip offline (resulting in unit shutdown), GLHA implements the station's minimum flow protocol, which is automated to provide an emergency outage flow of greater than 400 cfs to restore river flows to an hourly average of 400 cfs to protect aquatic habitat in downstream reaches of the West Branch of the Penobscot River as required by the Ripogenus Project license.

TU indicated in recent letters filed with FERC as part of the relicensing process for the Ripogenus Project that fish stranding occurs in large pools downstream of McKay Station during such station trip events.

## 5.0 Methods

GLHA will review operational data to identify the frequency and duration of unplanned station trips and temporary emergency minimum flow events at the Ripogenus Project that have occurred since February 2018 when the current outage procedure for implementing emergency minimum flows during an unplanned outage was implemented. GLHA will document these station trips, including a description of the start time and end time of emergency minimum flow releases from McKay Station, and the reason for each station trip.

GLHA will perform a field study in the fall of 2022 during simulated "station trip" conditions at the Ripogenus Project to provide information about fish stranding that may occur downstream of McKay Station. The simulation event will be modeled after a "typical" station trip event identified from the 5-year operational data review (2018 – 2022). The specifics of the simulation event will be developed in consultation with the MDIFW and TU and will include implementation of the Station's minimum flow protocol following the "station trip" for a duration that is representative of the average duration of such events, based on the past 5 years of data (i.e., since the current operational protocols were implemented in February 2018).

GLHA will observe stranding conditions during the simulation trip event. GLHA proposes to complete the stranding surveys in safe and accessible areas of the following areas , which are accessible, heavily fished, and known to provide habitat for cold water salmonids and other species (Figure 1):

- Big Eddy
- Nesowadnehunk Pool/Deadwater
- Telos Bridge

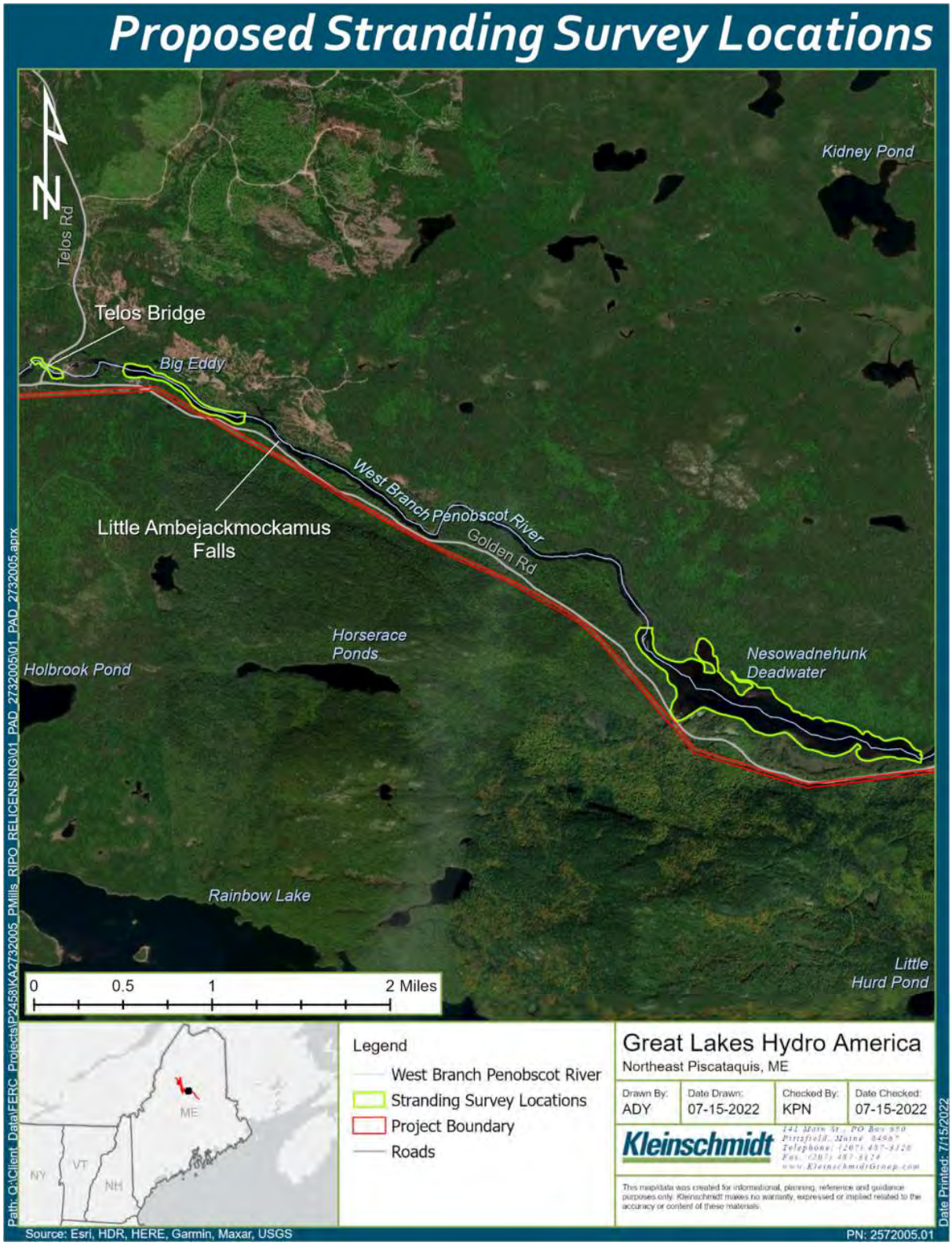



**Figure 1. Proposed Stranding Survey Locations.**

Field crews will perform reconnaissance surveys during simulated "station trip" conditions to determine whether stranding could potentially occur in these reaches during station trip conditions. Field crews will survey the perimeter of the pools on foot, by boat, or with a drone to visually document evidence of stranded fish, look for fish trapped under rocks, and to the extent possible, collect data on the species, approximate fish size, the number of fish stranded and their location, and the condition of stranded fish (e.g., stressed, injured, dead). GLHA will also take photographs or videos of stranded fish and pool habitat to document the effects of outage flow conditions on fish and habitat. If necessary, a drone will be used to supplement documentation for wide-area coverage and provide observations in areas that may be challenging to access; the drone will also provide geo-referenced, high-resolution video or still photo images.

In addition, GLHA will install a level logger in the pools to assess the duration and magnitude of the event (i.e., change in water surface elevation) that results from the outage flow release. Level loggers will be used to monitor water surface elevation for approximately 12 hours preceding and following the simulated outage flow release; loggers will be programmed to record water pressure data at 5-minute intervals. Water pressure data from the level loggers will be converted to depth of water above the logger to determine changes in water depth resulting from the outage flow.

## 6.0 Reporting

GLHA will prepare a fish stranding study report that describes outage flow operational data for the period 2018 through 2022 and summarizes the results of the field surveys during the simulated emergency outage flow release.

## 7.0 Schedule

GLHA anticipates performing the field survey in early October 2022. This time frame equates to a biologically active period for salmonids and other species, and it is outside the peak whitewater rafting season to minimize conflict with recreational activities.

# Attachment B

## Stranding Evaluation Study

***Goals and Objectives***

The study will provide information regarding the potential for fish stranding associated with the Ripogenus Project. The study objective is to determine the extent and degree of danger stranding pools that occur from below the McKay Station discharge to Nesowadnehunk Falls, especially under 400 cfs generator trip events.

**Known Resource Management Goals** (Under §5.9(b)(3) If the requester is a not a source agency, explain any relevant public Interest.)

The requestor, Maine Council of TU, is a non-governmental organization (NGO).

Maine's rivers, great ponds and wildlife are, by law, public resources. The West Branch of the Penobscot is one of the areas in Maine that TU members most prefer for fishing and other recreational activities, and thus TU has a direct interest in the waters affected by project operations, especially those from Ripogenus Dam to below Nesowadnehunk Falls.Background and Existing Information

There is no existing information regarding stranding-prone areas or operational scenarios for the Ripogenus Project. This study is needed to quantify project effects on a potential source of fish mortality and injury.

**Project Nexus**

Generator trip events at McKay Station occur with some frequency and it is a matter of record that two such events occurred during the August-September timeframe of 2021 when strandings were photographically documented.8 It is hard to image aspects of project operations that could have a more direct relationship with the welfare of aquatic organisms than immediate, drastic flow reductions.

**Methodology**

Task 1: Operational Data Review:

Prior to conducting the field investigation, a desktop literature review will be performed to gather information on the range of flows when generator trip events are likely to occur. We anticipate that since thunderstorms occur during the summer, whitewater flows generally of 2200 – 1800 cfs would generally be in effect when the outages occur.

Task 2: Field Surveys:

The field survey will consist of a reconnaissance level evaluation where a field crew will examine potential stranding sites in the study area at an appropriate time interval after spilling operations have ceased. Any accessible pools with fish stranding potential will be identified and visited shortly after the spillage event. On-ground surveys will traverse any pools and visually document fish present as well as looking for fish trapped under rocks. Information on the number and location of fish stranded will be recorded. In addition, the conditions of the study area will be photo-documented.

Consistency with Generally Accepted Scientific Practice

The proposed survey to document potential stranding areas is an accepted means of documenting species use in the Project area.

**Deliverables and Schedule**

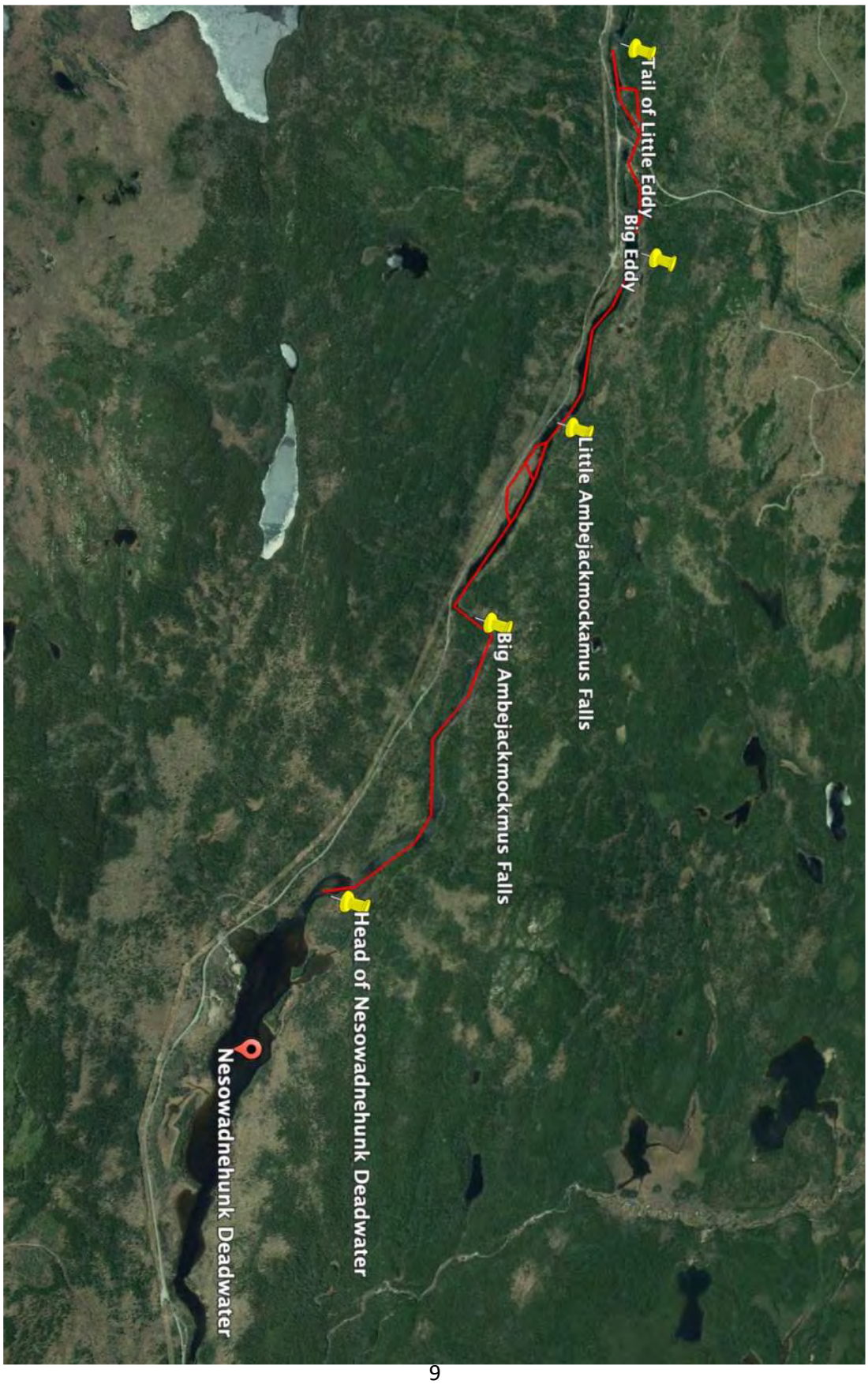
The survey effort will be conducted during the summer/fall of 2022. Data and results will be included in the Initial Study Report to be filed with FERC in 2023.

**Cost and Level of Effort**

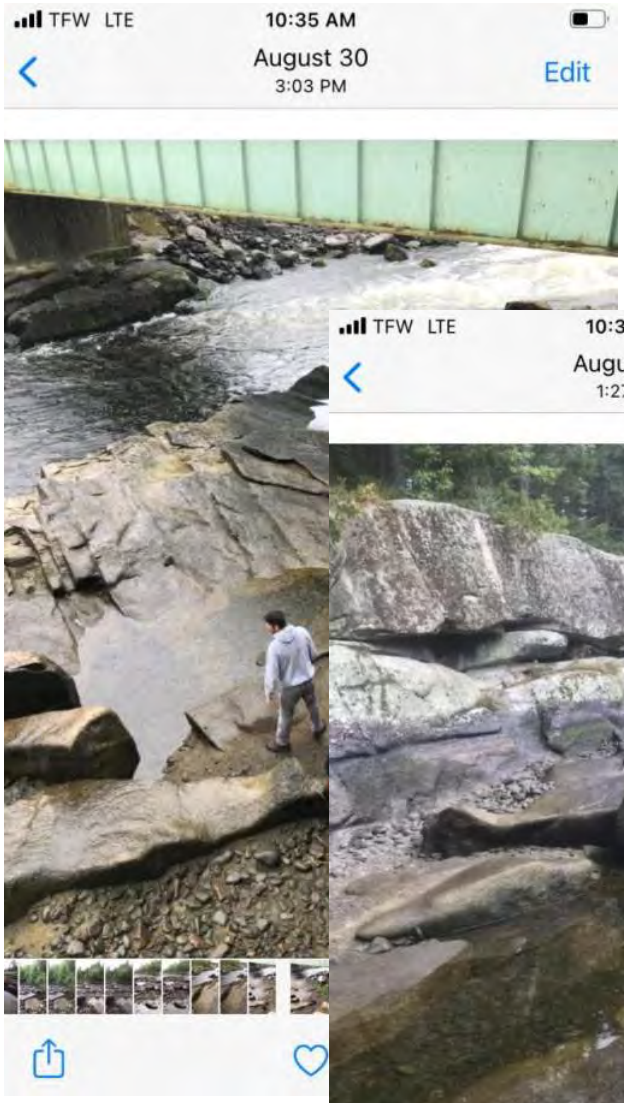
The estimated cost for the stranding evaluation is approximately $20,000. This level of effort is consistent with the size of project operations.

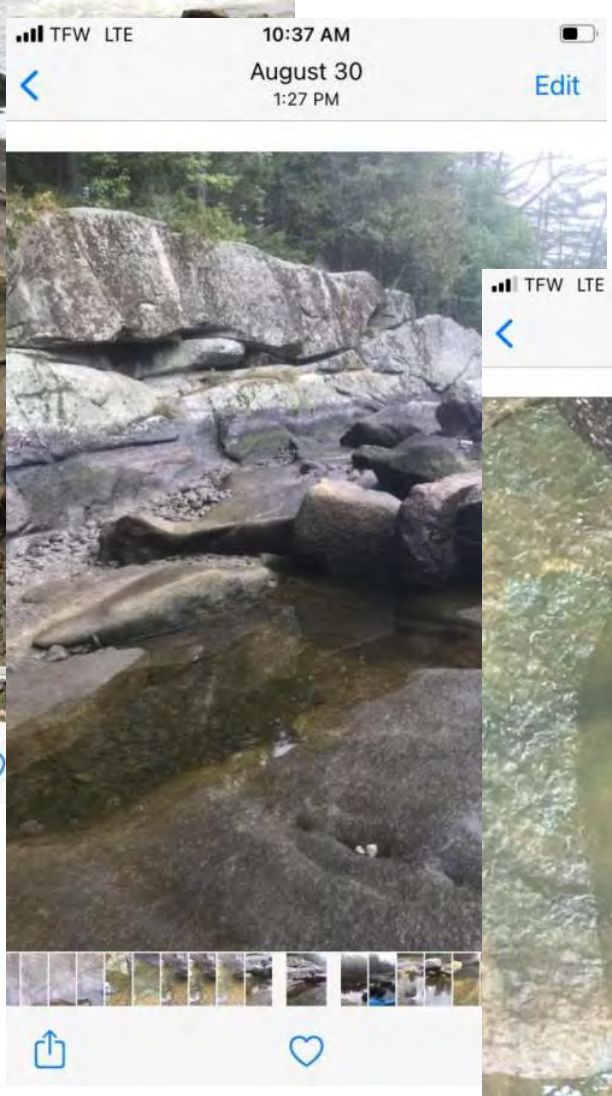
The Applicant may be able to combine this study with any testing of equipment and procedures ordered by the FERC Compliance Division as part of its investigation in the low flow events previously referenced, especially generator trip events. This could provide significant cost savings lowering the cost estimate provided above.

**Attachment C**



**Attachment D**






Kimberly D. Bose September 25, 2022
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426 Via Electronic Filing
.

Project No. 2572-136 : Ripogenus Project, Comments On Great Lake Hydro America's September 28-30, 2022 McKay Station Maintence Plans

In a recent Brookfield posting on their Safe Water Website, Great Lake Hydro America (the Licensee) is warning of low flows downstream of Ripogenus Dam this coming week. For the two and a half day period, West Branch of the Penobscot River (West Branch) flow will be provided through the Ripogenus Dam deep gate(s). The posted Safe Water's information is:

*Short-term schedule*

*9/28/2022 - 2 PM - 9/30/2022 11:59 PM 1100 CFS*

The scheduled West Branch flow ignores fish and aquatic communities concerns as well as fishing opportunity. Juvenile salmonids and aquatic insects along the West Branch shoreline and in side channels will be forced to move (if possible) and/or be dewatered. Of special concern is the Holbrook Bypass Channel (Article 406 of the 1996 License) and protection of juvenile salmonids, namely Landlocked salmon.

The Holbrook Bypass Channel was designed to produce young-of-the-year Landlocked salmon (salmon). The agencies considered Increases in this life stage abundance as necessary in increasing the West Branch adult salmon population. McKay Station flows of 1100 cfs do not meet either the 35 cfs or 60 cfs Article 406 flow requirements. Two salmon year classes (fry and parr) are at risk. There is no indication of agency consultation that waives these

flow requirements. It appears that the Licensee is again about to willfully violate Article 406 of the Ripogenus Project License.

The Licensee should not be allowed to arbitrarily act outside of license requirements. I request that FERC act to stop the proposed degradation of fish and macroinvertebrate communities in the mainstem West Branch and in the Holbrook Bypass Channel. Fish and macro invertebrates communities need protection.

Thank you for the opportunity to comment.

Ed Spear
307 Mt Hope Ave
Bangor, Me 04401
Phone 207-217-4288

CC: Alicia Burtner

# Report of Observations – October 5, 2022
## Stranding Study of West Branch of the Penobscot River below McKay Station

Stephen G. Heinz, Maine TU Council FERC Coordinator, October 19, 2022

## Introduction

A stranding study was conducted by Brookfield Renewable (Brookfield) on October 5, 2022 to comply with the Federal Energy Regulatory Commission (FERC) Study Plan Determination.[1] Brookfield announced the study by email[2] to a small distribution of stakeholders about three weeks before the study asking for comments by September 28, a week prior to the event. The draft study plan concentrated most of the effort on the Big Eddy and the Nesowadnehunk Deadwater, areas that were unlikely to contain stranded fish, and included provision for data collection by drones. Maine Council of Trout Unlimited submitted comments disagreeing with this approach calling for "boots on the ground" and filed them to the FERC docket.[3] When it was confirmed a week prior to the event that it would go as scheduled, Maine TU Council sent out an "Action Alert" email to the Maine TU membership, and forwarded it to other organizations with possible interest. Despite the short notice, enough volunteers were recruited to man five two-person teams to observe the conduct of the study and record what they saw in a structured manner. TU received no final study plan prior to the event.

## Methods

Volunteers were instructed to assemble at Big Eddy Campground at 8:30 on the morning of October 5, 2022. A briefing was presented that covered safety, data collection, team composition and area assignment. All volunteers arrived on time, took the briefing, and signed hold harmless/photo authorization forms. Randy Dorman, assigned Brookfield licensing manager for the project, came into the briefing while in progress and expressed welcome for our presence.

Safety Instructions:

Work in pairs, keep buddy within sight and sound

Primary hazards are slipping and tripping

Take your time and do a thorough search – it's safer and more effective

If someone is injured and you have to go for help, get them out of the watercourse first

[1] Study Plan Determination for the Ripogenus Hydroelectric Project and the Penobscot Mills Hydroelectric Project dated May 13, 2022.

[2] Email from Cate Russell HDR, Subject - Ripogenus Project: Draft Fish Stranding Study Plan, September 13, 2022 at 5:04 p.m.

[3] Maine TU Council letter dated September 23, 2022, Subject: Comments of Maine Council of Trout Unlimited on the Draft Fish Stranding Study Plan.

Nearest hospital is Millinocket Regional Hospital, 200 Somerset St, Millinocket, ME 04462. This is off Route 11 just past and north of where it is joined by the Golden Road

Event set for 9:30 to 1:30. Pick a watered rock in your vicinity and check for water level periodically - everyone headed to shore at 1:00.

Brookfield may deploy drones to look for strandings. If they do, go to shore until they pass.

Don't get stuck on far bank below the Big Eddy

Water and a snack recommended

Check out before you leave – everyone must be accounted for

Data Collection Instructions:

Take an initial photo (and others if needed) showing the extent of the dewatering that the event causes.

Photo document anything alive that you find in unconnected pools - if in doubt, document

Key information: time, location, brief description*, photo #

*fish species, macro-invertebrate species, other

Use the data sheet provided if you can't keep this all on your phone

It is more important to cover area well than to cover more area

Be prepared to show what area you covered at the end of the day

Give the Brookfield crews a wide berth, do not get in their way, muddy waters, engage them, etc.

Team Composition:

| **Team #** | **members** | **affiliation** | **reach** |
|---|---|---|---|
| 1 | David Bean | NOAA Fisheries | Holbrook side channel |
| | Max Tritt | NOAA Fisheries | Holbrook side channel |
| 2 | Mike Enos | TU | Holbrook South |
| | Jim Hayes | Penobscot Fly Fishers | Holbrook South |
| 3 | Charlie Spies | TU | Cribworks |
| | Steve Heinz | TU | Cribworks |
| 4 | Julie Puleio | | Little A Falls |
| | PJ Smith | TU | Little A Falls |
| 5 | Rory Hannon | UMO | Big A Falls |
| | Angela Hannon | UMO | Big A Falls |
| N/A | Sarah Sindo | Big Eddy Campground | n/a - volunteer coordination |

Team members were given the opportunity to review this report.

Area:

TU indicated its general areas of concern in its draft study plan comments, and Figure 1[4] indicates in red those areas that stretch from the tail of the Little Eddy to the head of Nesowadnehunk Deadwater. This (including side channels) encompassed some 5 river miles more or less. Complete coverage could not be accomplished due to the limited number of volunteers available on the short notice provided for the Brookfield study.




**Figure 1**

General. Each team was given a black and white paper map showing desired observation areas. These areas were based on a best guess of where strandings would be most likely to occur based on past strandings and cursory analysis of the topography. White lines indicated general areas of interest. Please note that these areas differed significantly from the areas that Brookfield proposed in its draft study plan[5] that devoted most of its area coverage to the Big Eddy and the Nesowadnehunk Deadwater, areas that were unlikely to contain stranded fish due to their topography which is predominately composed of deep runs and large pools of

[4] Id., Attachment C.

[5] Draft Stranding Study Plan forwarded by Email from Cate Russell HDR, Subject - Ripogenus Project: Draft Fish Stranding Study Plan, September 13, 2022 at 5:04 p.m.

significant depth that could be dewatered per the study parameters but still retain several feet of water depth. Specific TU observation area descriptions follow, corresponding maps are included as attachments due to size. The white line indicates areas of general interest, yellow shading indicated general areas each team was able to actually cover and make first-hand observations, red areas indicate those where a relatively high incidence of strandings were observed. Assigned coverage areas were less than those shown in Figure 1, actual coverage by the teams within assigned areas was less than the entire reach as teams tended to cover areas that showed the most potential for strandings as the water receded. Team 3 was not able to cover an area of likely strandings due to the rugged character of the dewatered terrain. The teams furthest downstream started latest waiting for the water levels to drop, but were required to leave the water course by 1:00 PM. This put them at a time disadvantage, but they found significant numbers of dead and stranded fish and stranded macro-invertebrates.

Holbrook side channel. The Holbrook side channel and portions on the north bank between the tail of the Little Eddy and where the side channel rejoins the main stem of the river. The map is included as attachment A.

Holbrook South. The south bank of the main channel between the tail of the Little Eddy and Telos Bridge. The map is included as Attachment D.

Cribworks. Area from Telos Bridge to the head of the Big Eddy. The map is included as Attachment G.

Little A Falls. South bank and side channels of the area below Little A Falls. The map is included as Attachment J.

Big A Falls. The east and south banks of Big A Falls and area downstream of the falls to the first riffle. The map is included as Attachment M.

## Results

Flows prior to the event appeared to be consistent with the representative 2200 cfs TU had requested in its comments of the draft study plan. The event appeared to commence on time – 9:30. There were noticeable differences in time lags required for flows and levels to drop at the various areas downstream where the volunteers were prepositioned. Vertical drops in water levels varied between areas based on bottom topography. By 2:30, levels and flows at the Big Eddy appeared consistent with the 1700 cfs post-event target flow. Subsequent reporting by Brookfield[6] showed restoral of target flows at 1:57 p.m., a 4 hour and 28 minute outage. It should also be noted that the initial trip flow was reported as 12 cfs but went to 400 cfs quickly.

[6] Brookfield letter dated October 12, 2022, Subject: Ripogenus Project (FERC No. 2572); Planned Minimum Flow Modification.

A significant number of strandings occurred that resulted in observed fish mortality. All five teams reported fish and macroinvertebrate strandings, four teams reported dead fish, including salmon parr, brook trout, dace, sculpin and unidentified minnows; Team 1 did not report dead fish, but uploaded a short movie showing a fish in a drying pool that could not have survived. The good news was that the Holbrook side channel functioned as designed and remained watered from bank to bank. This is a constructed feature designed to provide spawning and nursery habitat for salmonids. This was a remediation measure included in the current license that MDIFW and Brookfield share credit for making work effectively to improve the greatly modified resource that the West Branch of the Penobscot represents.

| Team | Fish* | Minnows# | Dead fish & minnows | Invertebrates |
|---|---|---|---|---|
| 1 | 8 | 12 | 0 | Many |
| 2 | 2 - 3 | 12 | 9 | 100s of nymphal insects, 12 crayfish |
| 3 | 14 | 2 | 1 | Too numerous to count |
| 4 | 45 | 30 | 15 | Countless |
| 5 | 10 | 35 | 35 (all the fish, 25 minnows) | 95 counted |
| Total | 79-80 | 91 | 60 | Much too numerous to count |

* Fish were defined as all salmonids and others over 2 inches in length

# Minnows were defined as fish under 2 inches in length

Fish. Landlocked salmon parr were the predominant fish species stranded. Brook trout were observed as well.

Invertebrates. Macro-invertebrates were present in tremendous abundance. Species included golden stonefly nymphs (Perlidae), black stonefly nymphs (Pteronarcyidae), green rock worm (Rhyacophila), dragon fly nymphs (possibly family gomphidae genus hagenius and family cordulegastridae, genus cordulegaster), hellgrammites, crayfish, leeches and others.

Minnows. Species included black-nose dace, sculpin, and others.

Photography. Selected team imagery is included with the attachments that are organized by teams. Additional imagery is available for viewing online at https://drive.google.com/drive/folders/1ssnvwFOlQhT_fn93gN1Vk1la1chPv53S?usp=sharing

Team 1 included a short movie of a landlocked salmon trying to escape from a disconnected pool and another in a pool that was drying up. Team 2 offered a Power Point presentation describing the images it contained. Team 3 included short videos of multiple salmon parr stranded in a small pool and another of a salmon parr struggling on ledge trying to reach water. Team 4 included 8 movies, mostly of stranded fish in pools. The remainder of the images are still images.

## Discussion

Area Coverage. The actual area that the 5 volunteer teams was relatively small compared to the area specified in the FERC Study Plan Determination[7] or as defined in TU comments on the draft stranding study plan.[8] The teams deployed furthest downstream could have stayed on task longer due to the time lag required for water levels to rise, but this course was not taken in the interests of safety. A ballpark figure for the actual coverage was 5 to 10 % of the area FERC specified in the SPD.

Substrates. Three substrate scenarios where strandings occurred when dewatered were noted: ledge with depressions, mixed boulder and gravel, porous gravel. Sloping banks were not generally conducive to strandings regardless of substrate.

Predation. Predation was likely higher during the event. Besides strandings, such a precipitous water level drop causes disorientation and stress to aquatic species. Team 2 observed a merganser consuming a salmon parr in a pool of reduced size, Team 3 observed crows on the banks likely consuming stranded macro-invertebrates.

Mortality Factors. Conditions were relatively benign during the event with air and water temperatures mostly in the 60s. Dead fish were observed by all but one team, and this would have likely been more severe if conditions during the event more closely resembled those expected to cause an unplanned trip event: a thunderstorm during the hottest part of the summer, a northeast storm during the coldest part of the winter. It remains unknown how far downstream the effects of the event persisted. The furthest downstream observations were taken about four miles downstream from McKay Station. One would expect for the effects to continue at least another mile downstream to the head of the Nesowadnehunk Deadwater. It would be difficult to determine mortality in the deadwater because dead fish tend to sink and the pool is deep. Adverse effects could continue further downstream to the next impoundment, North Twin. Fish size also seemed to be a significant factor: smaller salmonids and minnows were less likely to survive than larger fish. Duration of the event would also play a major role in mortality rates of stranded fish: the longer the event, the higher the mortality.

Larger Ecological Effects. Few dead macro-invertebrates were observed. Again, relatively benign conditions likely contributed to this. Had the event occurred during sub-freezing or extremely hot weather, it is safe to assume more macroinvertebrate mortality would have been observed. For example, and there are many, one stranded dragonfly nymph was found 20 feet from any water, that may have perished in the event. It is safe to assume that the trip event did not benefit any of the aquatic species, the magnitude of the harm is difficult to determine. Dewatering of aquatic vegetation also occurred. Again, this could have no positive effect, the magnitude of the harm is difficult to determine.

[7] SPD, page B-4: "...downstream from the McKay Station discharge to Nesowadnehunk Falls."
[8] Maine TU Council letter dated September 23, 2022, Subject: Comments of Maine Council of Trout Unlimited on the Draft Fish Stranding Study Plan, page 2.

## Conclusion

The observations conducted by TU teams deployed during the October 5, 2022 trip event demonstrate that significant fish stranding and mortality occur downstream from McKay Station when flows are reduced abruptly from 2200 cfs to 400 cfs. The incidence of mortality could be expected to increase further during dewatering events that occur in extremely hot or cold weather conditions when exposure to very warm or freezing air temperatures will more immediately impact the body temperature of stranded organisms.

Clearly, further data beyond what are contained in this report are required to determine the minimum flow required to prevent these strandings or if ramping flows would be less harmful to the aquatic life in the affected reach. The Initial Study Report from Brookfield is not due until May 13, 2023.[9] We trust that it will be consistent with our observations, and if it does not include empirical data indicating flows and duration of dewatering required to prevent future mass strandings, that Brookfield will propose additional studies to determine that.

[9] Brookfield letter dated October 12,2022, Subject: Ripogenus Project (FERC No. 2572); Planned Minimum Flow Modification, page 2.

## Attachments:

A. Team 1 Map
B. Team 1 Debrief Sheet
C. Team 1 Photos
D. Team 2 Map
E. Team 2 Debrief Sheet
F. Team 2 Photos
G. Team 3 Map
H. Team 3 Debrief Sheet
I. Team 3 Photos
J. Team 4 Map
K. Team 4 Debrief Sheet
L. Team 4 Photos
M. Team 5 Map
N. Team 5 Debrief Sheet
O. Team 5 Photos

## Attachment A




yellow: coverage area; red: high stranding area

## Attachment B

Debrief Sheet – Team 1

Team Members: David Bean and Max Tritt

Reach: Holbrook side channel

Percent Coverage: 70 %

Shot showing dewatered area: Yes, outside of the side channel

Number of stranded fish: 20 plus

Number of stranded invertebrates: many, mostly stonefly nymphs

Number of stranded others: minnows including common shiner, and black nose dace

Narrative: The team started their observations on the lower Holbrook reach at 9:33 and went upstream from Telos Bridge to the entrance of Holbrook side channel arriving at 10:00. Around the entrance to the side channel, we observed over 20 fish stranded in pocket water, mostly common shiner, black nose dace, brook trout and landlocked salmon parr – mostly young of the year but one salmon was over 7 inches in length. The flow in the Holbrook side channel was bank to bank and all of the stream habitat there was wetted and continuous, no stranded fish were observed in the Holbrook back channel. While no dead fish or minnows was observed, it was assumed that some would have succumbed in time. The team returned to the campground at 1:00.

The short movies may be viewed at –
https://drive.google.com/drive/folders/1ssnvwFOlQhT_fn93gN1Vk1la1chPv53S?usp=sharing

## Attachment C

Selected photos, additional available at https://drive.google.com/drive/folders/1ssnvwFOlQhT_fn93gN1Vk1la1chPv53S?usp=sharing



Holbrook side channel remained watered bank to bank



400 cfs provided adequate water to the intake pipes



Strandings occurred in main river beyond the side channel



Stranded brook trout parr



Stranded stonefly nymph



Stranded crayfish



Stranded blacknose dace

## Attachment D




| |
|---|
| yellow: coverage area; red; high stranding area |

## Attachment E

Debrief Sheet – Team 2

Team Members: Mike Enos and Jim Hayes

Reach: Holbrook South

Percent Coverage: 55%

Shot showing dewatered area: yes

Number of stranded fish: 2 or 3 landlocked salmon parr (overhanging rock prevented a sure count)

Number of stranded invertebrates: hundreds of nymphal insects, 12 crayfish

Number of stranded others: 12 minnows

Narrative: After arriving at our area at about 9:30, we took GPS coordinates at three access points to the river on the south bank.

The furthest access point upstream was where Holbrook Brook joins the river. There was a small island that formed when flows dropped and numerous unconnected pools. All pools contained stranded animals and plants. This section of our reach included:

2 or 3 salmon. Note: a merganser was photographed consuming a disoriented fish in a shallow but connected pool.

3 crayfish

100s of nymphal insects

Several minnows including one dace and other chub-like ones

We then proceeded to the access point furthest downstream. This section of the reach contained stranded minnows, nymphal larvae, and crayfish.

The area nearest the middle access was checked last. Not as many pools formed there. The drop to the river was steeper along this shore and not much was seen for stranded type pools and no fish or crayfish were seen here along this shore. A few insect nymphs, but no crayfish, minnows, salmon, etc. No Photos were taken here of organisms. Just a photo showing the view along the river.

We left the area at noon, and returned to the campground area. A Brookfield field crew and drone were observed in this reach.

## Attachment F

Selected photos, additional available at https://drive.google.com/drive/folders/1ssnvwFOlQhT_fn93gN1Vk1la1chPv53S?usp=sharing



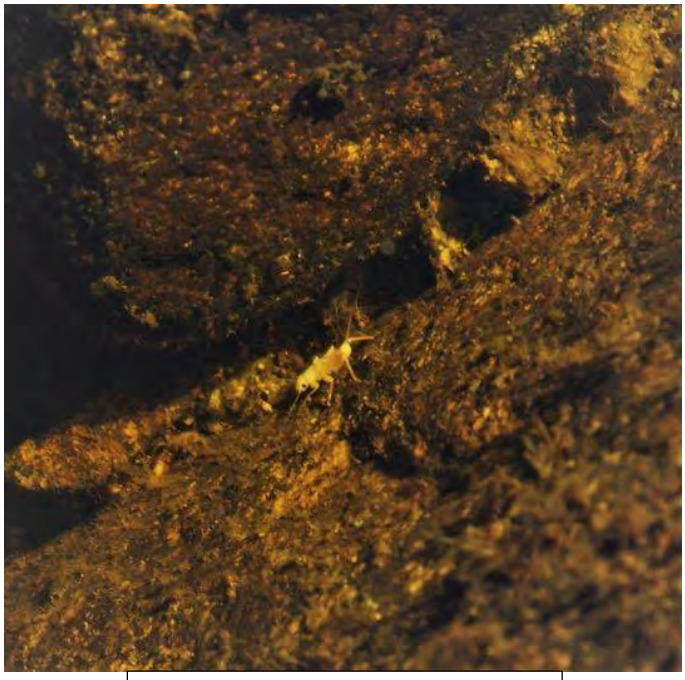
Disconnected pools pool, vicinity of location 1



Stranded salmon parr, vicinity of location 1



Pool that contained stranded salmon parr, vicinity of location 1



Dislodged stonefly nymphs



Stranded dragonfly nymph



Stranded crayfish with dead minnow



Merganser consuming fish in shallow pool



Dead minnows in lower pool



Variety of stranded nymphal insects in lower pool

## Attachment G




yellow: coverage area; red: high stranding area

## Attachment H

Debrief Sheet – Team 3

Team Members: Charlie Spies and Steve Heinz

Reach: Cribworks

Percent Coverage: 60%

Shot showing dewatered area: multiple

Number of stranded fish: 14, included one dead YOY salmonid

Number of stranded invertebrates: too numerous to count. Macro-invertebrates included black and golden stonefly nymphs, green rockworms, dragonfly nymphs, crayfish and leeches

Number of stranded others: numerous minnows including black-nosed dace

Narrative:

Team arrived at Telos Bridge at 9:25. At 9:30 AM Brookfield Power rapidly reduced main stem river flow from MacKay Power Station to 400 Cubic Feet per Second (CFS) from 2,200 CFS. This was done to simulate minimum downstream flows when the station turbines are shut down for repairs or load leveling. It is generally assumed that this occurs approximately four times per year due to unexpected demand interruptions or repairs. By 10:00 AM our team had observed a significant drop in the river level which seems to stabilize at the Cribworks reach at approximately four vertical feet below the higher flow observed before the simulated "trip event."

1) Cribworks Area (see map Attachment G): Time in 10:00AM; Time Out 11:25AM.

During the observation period, Team 3 covered approximately 60 % of the dewatered river edge areas. Dewatered areas were readily identified by moisture on the rocks and exposed plant growth that typically occurs below water level. The color difference between freshly dewatered shoreline and normally dry shoreline was dramatic and enabled differentiation, captured by photos P1-P4: full flow conditions (9:30 AM) and dewatered views (10:00AM) from Telos Bridge on north bank and and south bank respectively.

Team 5 descended to the south bank below Telos Bridge at 10:00 AM. We immediately found stranded fish and macroinvertebrates in the dewatered area (Photo 5 – Crayfish; Photo 6 Stonefly; Photo 7 Leech - all taken at ~10:04 AM). Definition of fully isolated pools became clear as water receded further from riverbed (Photos 8 and 9 10:16 AM).

At 10:20 AM we observed fish stranded in isolated pools (confirmed salmon parr and brook trout (Photo 10) and a salmon parr that attempted escape from a small pool but returned to the pool on its own. Same fish in same pool was recorded again at 10:44AM (Photos 11-13).

Multiple isolated pools containing stranded macroinvertebrates (stoneflies, crayfish, mayflies) and salmonids were observed during the period between 10:20 and 10:45 (Photos 14-18). The team also

observe a likely high-stranding area further downstream on the south bank but deemed it too dangerous to enter (Photo 19). The team left the south shore at approximately 10:45 AM to survey the opposite (north) bank.

The team surveyed the north bank beginning at approximately 11:07 AM (Photo 20 shows a portion of the reach upstream to the Telos Bridge; Photo 21 shows downstream portion). The team found a different topography than on RR. River left was steeper and seemed to allow for water to recede without creation of isolated pools. No fish stranding was sighted. However, sightings of multiple stranded macroinvertebrates in the dewatered area were common. Very often stonefly larvae and crayfish were found on dewatered rocks and sand as far as 15 feet from the main new low-water line (Photos 22 and 23). It seems unlikely they would successfully migrate to the water line from such a distance, especially the insect nymphs which are subject to desiccation. The team also observed crows actively feeding in the dewatered area and it seems likely that they were taking advantage of the exposed food bonanza of stranded macroinvertebrates.

The team exited the Cribworks reach at approximately 11:25 AM.

Culvert Pool Reach: Time in: 11:35 AM and Time out: 12:05 PM

At approximately 11:30 AM the team drove about ¼ mile below the Telos Bridge on river left to a reach called the "Culvert Pool" (see Attachment G). The topography was flatter than the north bank upstream at the Cribworks Photos 24 and 25). Some isolated pools were observed, including on containing Black-Nosed Dace (Photo 26) and much of the dewatered area exhibited multiple stranded macroinvertebrates, including stonefly nymphs and crayfish with lesser populations of caddis fly nymphs and dragon fly nymphs (Photo 27 shows a dragon fly nymph located 20 feet from the water line). Many of these insects and crayfish were found between 15 and 20 feet from the water line. Crows were observed feeding in this area.

Our team left this area at approximately, 12:10.

Side Channel below Cribworks and feeding Culvert Pool River Right: Time in: 12:20 PM; Time Out 12:50 PM

This side channel (Attachment G) was traversed for its entire length until it emptied into the main stem above the Culvert Pool Reach on river-right. It is not a main channel in the river and is approximately 20 feet across and slow-flowing when compared to the main stem. It is separated from the main stem by an island. The channel was deep with steep sides and remained mostly well-watered. Few isolated pools were observed. No stranded fish were observed and few stranded macroinvertebrates were observed.

Summary of Team 3 Observations:

Dewatering CFS from 2,200 to 400 resulted in significant and rapid river level decline (over 30 minutes to lowest level at the Telos Bridge location). This clearly impacted both fish populations and macroinvertebrate populations. Depending on riverside topography the impacts on fish varied. Where the dewatered river's edge was relatively flat a significant number of isolated pools emerged with stranded fish. Many of these continued to drain via the porous sand/rocky river bottom and resulted in fish trying to exit over land and stranding out of water. The south bank area below Telos Bridge is a

good example. Of the number of stranded fish observed by our team, approximately 20, (some isolated pools may have held more fish than we could directly observe), we spotted several fish that were either fully stranded and dying or likely to die due to lack of water or adequately oxygenated water before stream levels recovered later in the day (after 1:30 PM). Fish mortality for those stranded is estimated to have approached 20% given our observations.

In all areas observed river level decline was significant at 3 – 6 feet depending on topography. In all observed areas stranded macroinvertebrates were common and abundant in dewatered edges. In some cases, stranded populations were observed as far as 20 feet from the river's low water edge. Mortality of insect larvae seems extremely likely. At the time our observations were made air temperature was in the low 60-degree Fahrenheit range. The incidence of macroinvertebrate mortality could be expected to increase further during dewatering events that occur in extremely hot or cold weather conditions when exposure to very warm or freezing air temperatures will more immediately impact the body temperature of stranded organisms.

Prior coverage of the north shore and area just above the Big Eddy by a Brookfield field crew may have affected our results. The crew had a dip net, they may have returned some stranded fish to flowing waters. Most of our stranding fish were discovered in the first hour of investigation in an area the Brookfield crew had not covered – we believe that most perished. We did not return them to flowing waters because we did not want to affect the results of the Brookfield study. Two short movies were recorded: one shows a disconnected pool containing multiple landlocked salmon parr, the other a landlocked salmon parr flopping on ledge trying to escape a small disconnected pool. These and photos not included in Attachment I but can be viewed at -
https://drive.google.com/drive/folders/1ssnvwFOlQhT_fn93gN1Vk1la1chPv53S?usp=sharing

## Attachment I

Selected photos, additional available at https://drive.google.com/drive/folders/1ssnvwFOlQhT_fn93gN1Vk1la1chPv53S?usp=sharing



P3 – watered area below Telos Bridge, south bank



P4 – dewatered area below Telos Bridge, south bank



P5 – stranded crayfish



P6 – stranded stonefly nymph



P7 – stranded leech



P9 – further isolated pool development



P11- salmon parr stranded on moss after jumping out of pool



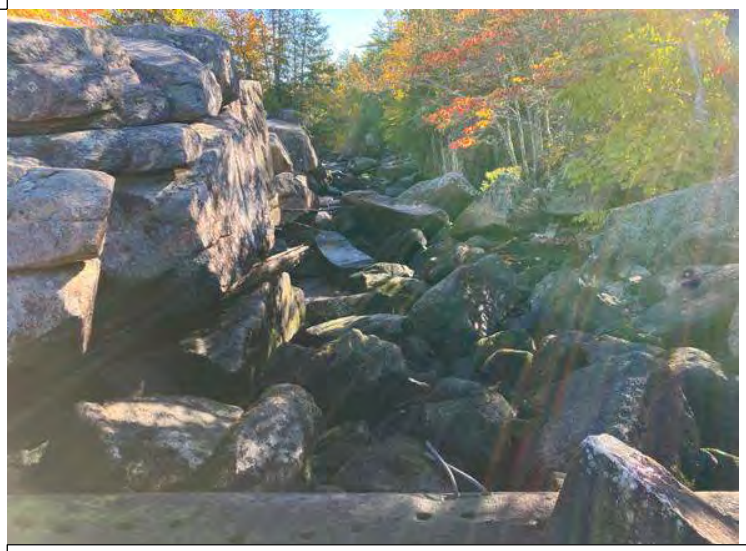
P13 – live salmon parr stranded in small pool



P16 – salmon parr exiting small pool



P17 – salmon parr stranded on ledge



P19 – likely high stranding area too dangerous to access



P21 – below Telos Bridge – north bank



P22 – stranded crayfish



P23 – stonefly nymph stranded > 15’ from flowing water



P25 – view downstream at Culvert Pool



P26 – stranded blacknose dace

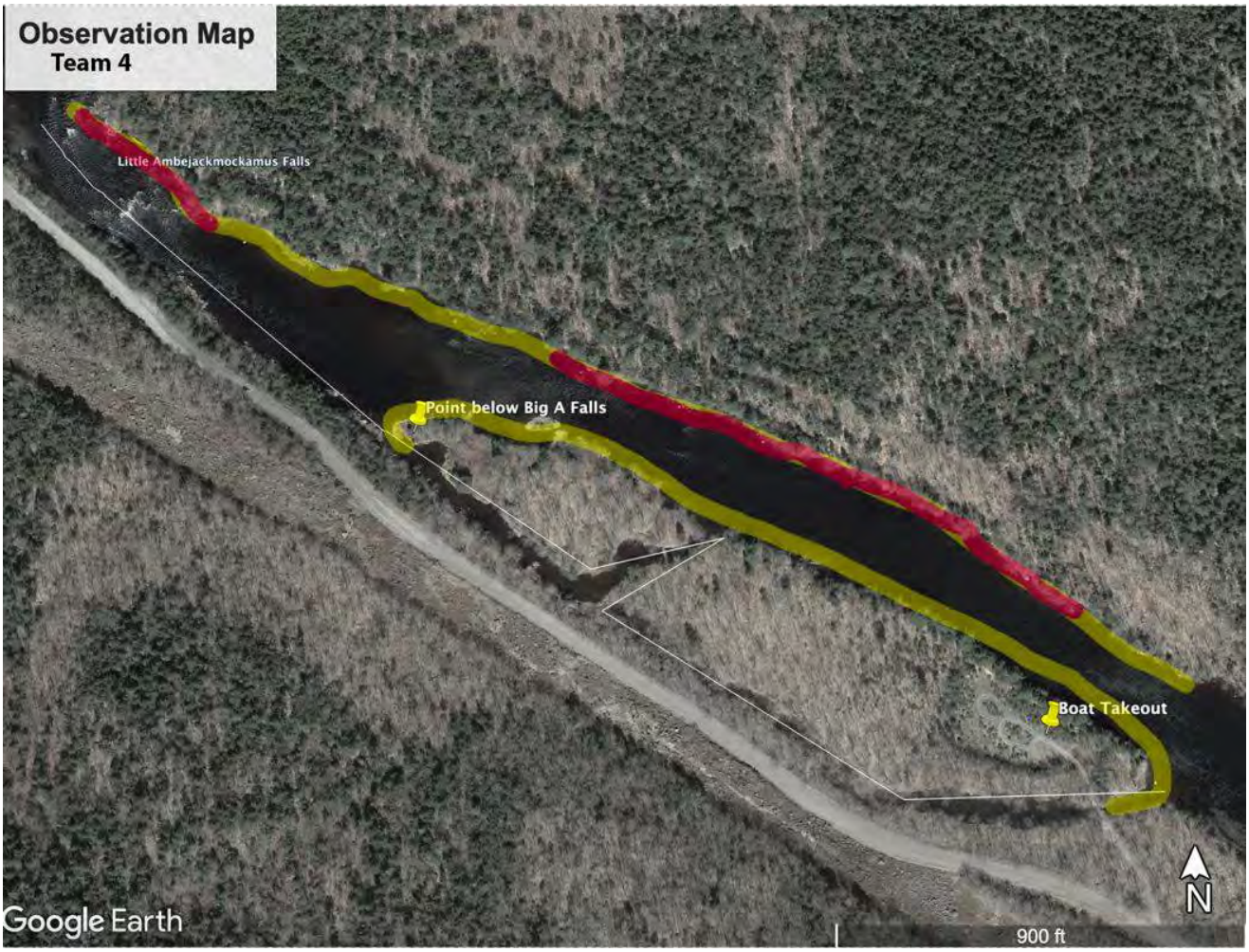


P27 – dragonfly nymph stranded >20’ from flowing water



P28 – dead salmonid YOY

## Attachment J




yellow: coverage area; red: high stranding area

## Attachment K

Debrief Sheet – Team 4

Team Members: Julie Puleio and PJ Smith

Reach: Little A Falls

Percent Coverage: 50% plus of south shore with additional coverage of north shore, back channels were not covered.

Shot showing dewatered area: yes

Number of stranded fish: over 45, 15 dead

Number of stranded invertebrates: many including 100s of stonefly nymphs and some crayfish

Number of stranded others: ~36 shiner minnows, many other dead fry

Narrative:
The team arrived at the boat takeout at 9:40 and began to walk upstream [west], but it would be an hour before flows began to drop.

We walked to the point just downstream of Little A Falls and continued on the south shore down to the boat takeout. At 10:30am, we saw countless black and golden stonefly nymphs and approximately three dozen stranded shiners along one stretch of the shore (example images collected between 10:28am and 10:39am).

By 11:00am, low flows had exposed a wadable route to the north shore that we could see contained disconnected pools. Enroute, we found a pool with 5 stranded trout and salmon (example image 10:50am). By 11:45am, the pool had dried up and the fish had perished (example image 11:50am). In the remaining time on the opposite bank along Little A falls, we observed at least 40 stranded salmon in 8 disconnected pools; at least 10 of the salmon were dead. Multiple images and videos captured between 11:09am and 11:21am highlight this. The pools also contained hundreds of stranded stonefly nymphs and a number of crayfish.

After investigating the dried pool we returned to the north bank, this time further downstream (highlighted as the second, red high stranding area.) Here we also discovered approximately a dozen disconnected pools with one to many parr in each. Images and videos captured between 12:03pm and 12:06pm EST highlight this.

We began walking out at 12:45pm. We did not have time remaining to investigate the side channels that were part of our assigned area, as our observations lead us to investigate the north banks more heavily.

Eight short movies were taken during the course of the team's investigation. They may be viewed at - https://drive.google.com/drive/folders/1ssnvwFOlQhT_fn93gN1Vk1la1chPv53S?usp=sharing

## Attachment L

Selected photos, additional available at https://drive.google.com/drive/folders/1ssnvwFOlQhT_fn93gN1Vk1la1chPv53S?usp=sharing



Disconnected pools, south bank



Dewatered gravel bar, with dead salmon parr



Dead and dying salmon parr



Dead salmon parr



Stranded stonefly nymph, dead dace



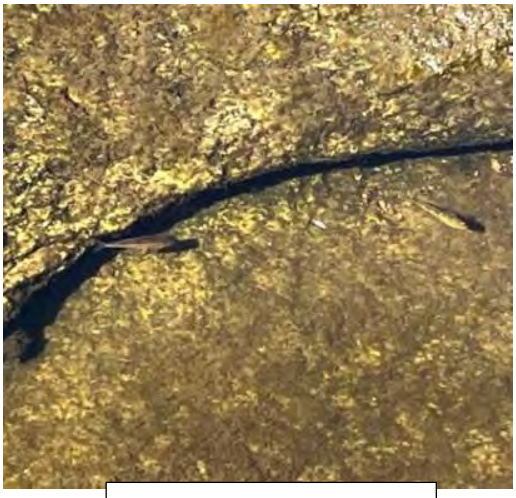
Stranded stonefly nymph



Disconnected pool, north bank



Dead salmon parr



Stranded salmon parr



Stranded salmon parr

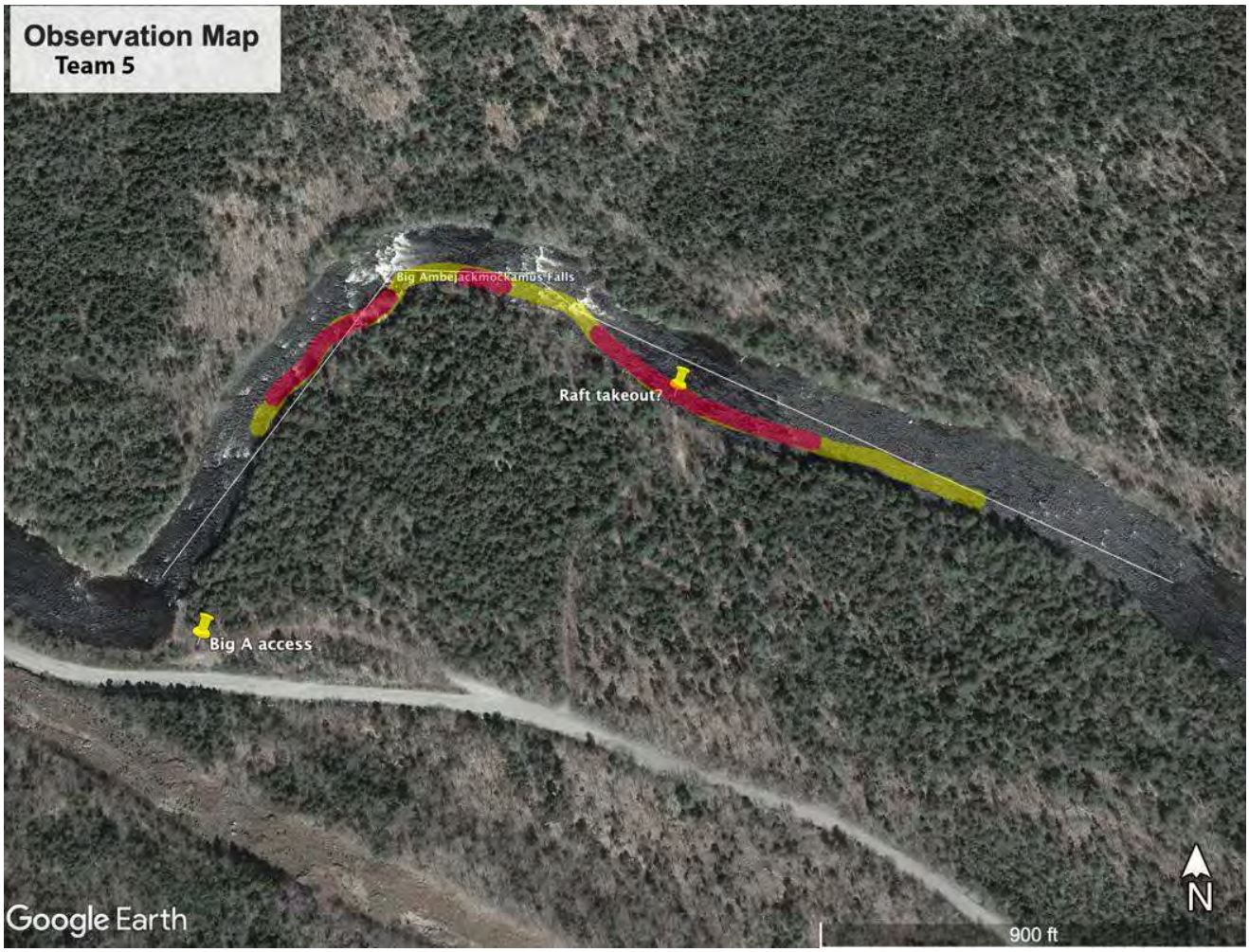


Dead salmon parr



Stranded crayfish

## Attachment M




yellow: coverage area; red: high stranding area

## Attachment N

Debrief Sheet – Team 5

Team Members: Rory and Angela Hannon

Reach: Big A Falls

Percent Coverage: 80%

Shot showing dewatered area: Multiple

Number of stranded fish: 10, half were dead

Number of stranded invertebrates: many including stonefly nymphs, dragonfly nymphs, hellgrammites, and crayfish

Number of stranded others: minnows included sculpin, black nosed dace and others.

Narrative: The team started at the raft takeout at the base of Big A Falls at 9:30 and walked downstream along the south bank and observed stranded macroinvertebrates, minnows, sculpin, crayfish and salmon parr. We then walked back to the base of the falls and started south where we also found many stranding of the above-mentioned organisms. We left the area at 1:00.

## Attachment O

Selected photos, additional available at https://drive.google.com/drive/folders/1ssnvwFOlQhT_fn93gN1Vk1la1chPv53S?usp=sharing



Disconnected pools at the base of Big A Falls



Dead landlocked salmon



Multiple dead black nosed dace



Dead salmon YOY



Stranded crayfish



Stranded sculpin



Multiple dead salmon YOY



Stranded hellgrammite



Dead minnow



Dead stonefly nymph



Stranded dragonfly nymph



Multiple species stranded or dead

Brookfield
Renewable

November 1, 2022

***Via Electronic Filing***

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Second Study Progress Report**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), Licensee of the Ripogenus Hydroelectric Project (FERC No. 2572) and the Penobscot Mills Hydroelectric Project (FERC No. 2458) (collectively referred to as the "Projects"), herein files with the Federal Energy Regulatory Commission ("FERC" or "Commission") the Second Study Progress Report for the relicensing of the Projects. The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot counties, Maine.

The current licenses for the Projects were issued on October 22, 1996 and expire on September 30, 2026. On June 11, 2021, GLHA filed the Notices of Intent and Pre-Application Document, which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through the Commission's Integrated Licensing Process (ILP). On March 23, 2022, GLHA filed a Revised Study Plan (RSP) for the Projects, and the Commission issued the Study Plan Determination (SPD) on May 13, 2022.

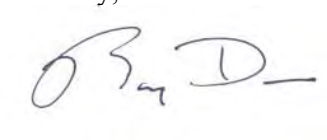
Pursuant to the RSP, GLHA herein submits the Second Study Progress Report for the period from August 1, 2022 through October 31, 2022 for the Projects. The enclosed table (report) provides a list of the required studies and associated status of progress, as well as any modifications to the approved methodologies.

Concurrent with this filing, GLHA is providing a copy of this letter to all parties listed in the attached distribution list. A copy of the Second Study Progress Report can be downloaded from FERC's eLibrary system at https://www.ferc.gov/docs-filing/elibrary.asp by conducting a search using the docket numbers p-2458 and/or p-2572.

Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462
www.brookfieldrenewable.com
Tel: 207.723.4341
Fax: 207.723.3948

If you have any questions regarding this letter, please contact me by phone at (207) 775-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman
Licensing Manager
Brookfield Renewable

cc: Distribution List

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

**Federal Agencies**

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Stephanie Carman
Acting District Manager
Northeastern States
Bureau of Land Management
626 E. Wisconsin Avenue, Suite 200
Milwaukee, WI 53202-4617

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Kimberly Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Deborah Szaro
New England Region 1
Regional Administrator (Acting)
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

**State Agencies**

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Kyle Olcott
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
101 Second Street
Hallowell, ME 04347

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Dr. Annette Padilla, PhD
Interim Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
4 Gabriel Drive, Suite 3
Augusta, ME 04330

Jeffery Gifford
State Representative
346 Frost Street
Lincoln Center, ME 04457

Peggy Jo Stanley
State Representative
413 Turnpike Road
Medway, ME 04460

**Native American Tribes**

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Marla Dana
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

**Additional Parties**

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground
ssindo@chewonki.org

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund
sperry@maine.com

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Emily Crowley
Curtis Thaxter
PO Box 7320
Portland, ME 04112-7320

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Kelly Maloney
Manager
Great Lakes Hydro America LLC
150 Main Street
Lewiston, ME 04240

Jesika Lucarelli
Great Mountain Guide Service
greatmountaings@gmail.com

John Dicentes
President
International Association of Machinists
64 Congress Street
Millinocket, ME 04462-1312

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Director
Maine Professional River Outfitters
PO Box 669
Millinocket, ME 04462-0669

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing
mary@mxhmarketing.com

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Allison Economy
Representative for Allagash Gateway Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Thomas Nannery
Sportsman's Alliance of Maine
205 Church Hill Rd
Augusta, ME 04330-9801

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Jeffrey Reardon
Maine Brook Trout Project Director
Trout Unlimited
267 Scribner Hill Road
Manchester, ME 04351

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,
sharon.klein@maine.edu

Jeff Fayle
jfayle@gmail.com

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti
granby@cox.net

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris
nsharris@mgh.harvard.edu

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Charles Paone
cpaonejr@gmail.com

Richard Parkes
Rparkesbb3@yahoo.com

Edward Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Robert Van Deventer
bobvnert@gmail.com

# SECOND STUDY PROGRESS REPORT

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>Second Study Progress Report<br>(August 1, 2022 through October 31, 2022) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 1a | Water Quality Study – Impoundment Lake Trophic Assessment | Pursuant to the RSP and SPD:<br>• Routine biweekly sampling events continued through October 2022.<br>• Data collected in 2022 will be provided in the ISR. | • GLHA was unable to access Black Pond during sampling events #8, #9, and #10 and Brandy Pond during sampling event #10 because of low impoundment water levels. |
| 1b | Water Quality Study – Downstream DO/Water Temperature Assessment | Pursuant to the RSP and SPD:<br>• Routine weekly data download events continued through September 2022.<br>• Data collected in 2022 will be provided in the ISR. | None. |
| 1c | Water Quality – Benthic Macroinvertebrate Assessment | Pursuant to the RSP and SPD:<br>• Benthic macroinvertebrate sampling was performed in summer 2022.<br>• Proposed sample locations were communicated to MDEP.<br>• Data collected in 2022 will be provided in the ISR. | None. |
| 1d | Water Quality – Impoundment Aquatic Habitat Assessment | Consistent with the RSP and SPD, the study is anticipated to be completed in 2022-2023 with available data provided in the ISR. | None. |
| 1e | Water Quality – Riverine Aquatic Habitat Assessment | Consistent with the RSP and SPD:<br>• Riverine aquatic habitat data were collected during the summer and fall of 2022.<br>• Data collected in 2022 will be provided in the ISR. | None. |
| 2 | Instream Flow and Habitat Assessment of West Branch below Stone Dam | Consistent with the RSP and SPD:<br>• GLHA conducted additional consultation, and field site visits were held with the agencies in August 2022.<br>• Data analysis and study results will be provided in the ISR. | None. |
| 3 | Fish Assemblage Survey Study | As required by the SPD:<br>• GLHA developed a Fish Assemblage Survey Study Plan in consultation with the applicable resource agencies.<br>• GLHA performed summer and fall surveys in the Ripogenus Impoundment and the West Branch downstream of the Ripogenus Project. | • Due to safety concerns with electrofishing in the Upper Gorge (below Ripogenus Dam) under required 100 cfs flow conditions, modified methods were used for sampling. |

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>Second Study Progress Report<br>(August 1, 2022 through October 31, 2022) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| | | • Data collected in 2022 will be provided in the ISR. | • GLHA was unable to access Brandy Pond and Black Pond with the required boat/gear for electrofishing during the fall sampling event due to low impoundment water levels. |
| 4 | Fish Stranding Study | As required by the SPD:<br>• GLHA developed a Fish Stranding Study Plan in consultation with the applicable stakeholders.<br>• GLHA performed the survey on October 5, 2022.<br>• Data collected in 2022 will be provided in the ISR. | None. |
| 5 | North Twin Impoundment Tributary Access Survey | Pursuant to the RSP and SPD:<br>• Based on the consultation with MDIFW following the mid-July tributary survey, GLHA surveyed the tributaries again in mid-October 2022.<br>• Data collected in 2022 will be provided in the ISR. | None. |
| 6 | Upstream American Eel Passage Assessment Study | Pursuant to the RSP and SPD:<br>• GLHA continued with weekly nighttime eel observations at East Millinocket Dam through October 2022.<br>• The two eel ramp traps at the toe of the East Millinocket Dam were operated in July and August.<br>• GLHA continued monthly nighttime eel electrofishing events through October 2022.<br>• GLHA collected eDNA samples from the East Branch, West Branch, and mainstem Penobscot Rivers (with sample locations per the SPD communicated to the applicable resource agencies) in late July 2022.<br>• Data collected in 2022 will be provided in the ISR. | None. |
| 7 | Desktop Downstream Eel Passage Route and Survival Study | Consistent with the RSP and SPD, the study is anticipated to be completed in 2022-2023 with available data provided in the ISR. | None. |

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>Second Study Progress Report<br>(August 1, 2022 through October 31, 2022) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 8 | Recreation Study | Pursuant to the RSP and SPD:<br>• Through September 2022, GLHA performed twice monthly recreation spot and calibration counts at the Project recreation sites.<br>• GLHA completed the recreation site inventory in the summer of 2022.<br>• Recreation user surveys will continue to be collected into the winter of 2022-2023 at the Project recreation sites.<br>• Available data collected in 2022-2023 will be provided in the ISR. | None. |
| 9 | Whitewater Boating Assessment Study | Pursuant to the RSP and SPD:<br>• GLHA is continuing to interview whitewater boaters into the fall of 2022.<br>• Available data collected in 2022-2023 will be provided in the ISR. | None. |
| 10 | Aesthetic Study | Pursuant to the RSP and SPD:<br>• GLHA established key observation points (KOPs) and obtained photo-documentation of views from each KOP in late June and September 2022.<br>• Available data collected in 2022-2023 will be provided in the ISR. | None. |
| 11 | Historic Architectural Survey | Consistent with the RSP and SPD, the study is anticipated to be completed in 2022-2023 with available data provided in the ISR. | None. |
| 12 | Historical Operations Data Assessment Study | Consistent with the RSP and SPD, the study is anticipated to be completed in 2022-2023 with available data provided in the ISR. | None. |
| 13 | Operations Model Study | Consistent with the RSP and SPD:<br>• GLHA is in the process of developing and calibrating the operations model.<br>• GLHA anticipates consultation with interested stakeholders to discuss the model input data and calibration in Q1 2023.<br>• The model input data and calibration data will be provided in the ISR. | None. |

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>Second Study Progress Report<br>(August 1, 2022 through October 31, 2022) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 14 | Wood Turtle Habitat and Presence Evaluation Study | Consistent with the RSP and SPD:<br>• The study will be initiated in 2022 in consultation with the MDIFW.<br>• Available data collected in 2022-2023 will be provided in the ISR. | None. |
| 15 | Marsh Bird Survey Study | Consistent with the RSP and SPD:<br>• The study will be initiated in 2022 in consultation with the MDIFW.<br>• Available data collected in 2022-2023 will be provided in the ISR.<br>• If deemed necessary, field surveys will be performed between May 15 and June 30, 2023, with data provided in the USR to be filed with FERC in May 2024. | None. |
| 16 | Furbearer Survey Study | Consistent with the RSP and SPD, the study is anticipated to be completed in 2022-2023 (in consultation with MDIFW) with available data provided in the ISR. | None. |
| 17 | Common Loon Management Plan Assessment Study | Consistent with the RSP and SPD, the study is anticipated to be completed in 2022-2023 with available data provided in the ISR. | None. |
| 18 | Riparian and Littoral Habitat Assessment Study | Consistent with the RSP and SPD, the study is anticipated to be completed in 2022-2023 with available data provided in the ISR. | None. |
| 19 | Terrestrial, Botanical and Wildlife Resources Study | Consistent with the RSP and SPD, the desk-top portion of the study is anticipated to be completed in 2022-2023 with the field portion of the study completed during the growing season in 2023. Data collected in 2022-2023 will provided in the ISR, as available. | None. |
| 20 | Environmental Justice Study | Consistent with the RSP and SPD, the study is anticipated to be completed in 2022-2023 with available data provided in the ISR. | None. |

Kimberly D. Bose November 2, 2022
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426 Via Electronic Filing
.

Project No. 2572-132 : Ripogenus Project, Support and Comments on Trout Unlimited' s *Report of Observations on Ripogenus Project Fish Stranding Study* filed October 19, 2022.

On May 13, 2002 FERC filed a Study Plan Determination (SPD) that required Brookfield Renewable Energy/ Great lakes Hydro America (collectively the Licensee) to conduct a fish stranding study on West Branch of the Penobscot River (West Branch) below McKay Station. On September 13, 2022 the Licensee submitted a draft Stranding Study Plan (Plan) to determine the impacts of McKay Station outages or "trip" flows on West Branch fish, namely salmonids. The Plan stated that a study of fish stranding below McKay Station would be conducted on October 5, 2022. The Licensee asked for comments by September 27, 2022. Given that the Licensee had four months of advance knowledge of the FERC SPD that mandated this study, the filing request for comments and scheduled study date were not provided to stakeholders in a timely manner. Licensing is intended to be collaborative process involving the stakeholders. The timeline provided prevented this from happening.

It should be noted that the Licensee's Plan referenced the need to avoid interfering with recreationists, anglers, and boaters. This sad commentary demonstrates the Licensee's lack of knowledge of current recreational use e.g., anglers and boaters of the West Branch below McKay Station. During the last weeks of August, Monday-Wednesday daytime use e.g., kayaking, rafting, is minimal to nonexistent. Angler use is also minimal with peak activity in the evening. There was no need to delay the FERC mandated study for months because of angler and rafting concerns. Moreover, and ironically, the Licensee has no such qualms of the impact of peaking or minimum flow operations on recreational/angler use of the river during "normal" operations.

On September 21, 2022 I filed a comment/complaint arguing that the Licensee's September 15, 2022 Draft Outage Study Plans were inadequate and suggested

changes. I also referenced the Holbrook Bypass channel (Bypass) and the unique circumstances created by 2021-2022 low flows.

The Holbrook Channel Bypass Area

The artificially watered Holbrook Bypass Channel (Article 406) stranding issues differ from main channel concerns as there were likely no or few juvenile salmon present during the study. The Bypass was a major mitigation measure required by the 1996 License and was developed to supplement West Branch juvenile salmon production. Flows into the Bypass area are controlled by two gated pipes that extend from Holbrook Pool into the Bypass. Inflow is set at 30 or 60 cfs depending on salmon life stage and season.

On May 9, 2022 I filed comments on the winter 2021-2022 License Article 406 flow violations and discussed the impacts of low McKay Station flows during the Landlocked salmon (salmon) spawning and incubation season. Winter 2021-2022 flows were extremely low. Spawning success and subsequent 2022 juvenile salmon (eggs spawned in November 2021) production in the Holbrook Bypass were unlikely. The Licensee has not disputed this claim.

Members of the NOAA surveyed the Bypass area on October 5, 2022 and reported no stranding of salmonids. Photos of the Bypass area show a watered channel, a stream segment NOT suitable to juvenile salmon production or long-term survival. There were several low flow events in the summer 2022 “salmon nursey season” and NO suitable spawning and incubation flows in the winter of 2021-22. Thus, 20+ years of on-site work experience and professional judgment suggests that there were few, if any, juvenile salmon available to be stranded. MeDIFW may have recent (2018-2022) electrofishing survey data that are relevant to this issue.

The biological, seasonal, temporal, and spatial, issues that were not, or only partially addressed by the Licensee’s Plans were:

Biological – In the SPD, FERC Staff stated: “Rapid changes in flow and decreases in water surface elevation can increase the risk of fish and invertebrate stranding which may be stressful and/or lethal for aquatic organisms.” The West Branch macro invertrabrate communities support all salmonid life stages and are especially critical to adult salmon during the summer maintenance feeding period. The Licensee’s

initial study plan made no reference to macro invertebrates. Clearly the Licensee ignored FERC concerns expressed in the SPD. Hopefully the Licensee included aquatic communities in their final study plan and the October 5, 2022 field survey.

Juvenile salmon, notable alevin (the salmon life stage that leaves the redd around June 7th), grow into fry that are, larger and more mobile in October than in June and July. A Fall flow study ignores these changes (habitat selection, activity, mobility) in vulnerabilities. As waters cool and the growing season ends, salmonid and macro invertebrate activity declines as juveniles move out of shallow high velocity areas.

Seasonal – During the fall as waters cool, salmonids and macro invertebrate seek deeper water habitats and become less active. During the cooling period, growing season habitats support fewer individuals as juvenile salmon migrate from shallow riffle areas e.g., Ladd Hill Stream "run around", the Little A Falls "run a round", etc., into deeper water. In all cases, vulnerability to stranding is reduced as juvenile salmon move to these deeper river habitats.

The Licensee's Plan states "GLHA anticipates performing the field survey in early October 2022. This time frame equates to a biologically active period for salmonids and other species, …..". Currently, West Branch water temperature data are not available. Possibly water temperatures were above 50-55 f degrees the first week of October. The Licensee should provide minimum/maximum daily temperature data for the September 28 to October 5, 2022 period along with peer reviewed references to support their statement.

Temporal – Biological and seasonal behavior of fish and aquatic communities are linked to stream flows, temperatures and photoperiods; the bias caused by a Fall study when stream temperatures have dropped cannot be ignored (see above paragraph). This is compounded by the fact that fish and macro invertrabrates stranded or trapped in "side pools" would be less vulnerable to stranding/or isolation and subsequent mortality. Thus, the full impact of June-August emergency McKay Station outage/trip events will remain unknown.

Spatial – Initially, the Licensee proposed study sites which included slower, deeper habitats, not representative of the species and life stages at risk. Sample sites such as the Big Eddy and Nesowadenhunk Deadwater are not representative of river reaches with shallow high velocity habitats that increase vulnerability to fish and

aquatic communities stranding. It is unknown if the Licensee added additional observation sites.

Study Results

On October 5, 2022 the Licensee implemented its version of a Trout Unlimited (TU) Study Request of the impact of McKay Station emergency outage or "trip" flows on the West Branch. It is not known if aquatic communities were included or if the Licensee expanded their study area. The Licensee's report will be provided at a later date.

Fortunately, despite short notice, TU was able to assemble four two person teams and NOAA provided a two-person team. These lay teams and NOAA produced conclusive results while covering a number of critical river reaches NOT proposed by the Licensee. TU's observations filed October 19, 2022 provide a grim picture of the impact of McKay Station shutdowns and subsequent low flows (approximately 400 cfs) on fish and aquatic communities. Cursory study results including TU's graphic pictures of dead or moribund salmonids and macro invertrabrates confirm suspected major impacts on these communities.

TU's outage/"trip" request only dealt with the area immediately downstream of McKay Station continuing to below the Big Eddy; the area of angler usage and complaints. It appears that TU's observations efforts ended at the head of Nesowadnehunk Deadwater. Areas downstream of Nesowadnehunk Deadwater provide critical habitat for juvenile West Branch salmon and further downstream, North Twin Impoundment (P2458) juvenile salmon (results of upstream spawning migration). However, the Licensee's study design failed to identify the magnitude and duration of "downstream" impacts and consider the entire 21 mile stretch of river.

While not part of TU's initial study request, the lower end of the 21-mile West Branch reach below McKay Station provides spawning and nursey habitat for salmon from the both the reach between McKay Station and Pockwockamus Falls as well as the North Twin Impoundment salmon(see 1992 North Twin Project FERC Application). A Maine Department of Inland Fisheries and Wildlife (MeDIFW) tributary spawning study request (October 8, 2021 *Study Request 8: Landlocked Salmon Habitat Use/Spawning Study—Penobscot Mills Project*) made by the MeDIFW Enfield office emphasized the importance of this lower river reach and the

continued production of naturally spawned (as opposed to stocked) salmon. Significant salmon recruitment to the North Twin impoundment is limited to juvenile fish from Nahmakanta Stream and the West Branch above Ambajejus Lake. Loss of West Branch salmon recruits through dewatering severely compromises MeDIFW's North Twin salmon management goals. The fact that reaches downstream of Nesowadnehunk Falls were excluded from the Licensee's Study Plan was a major flaw and outage flow downriver impacts need to be addressed.

Operational Issues

The Licensee's initial study plan called for a simulation of a McKay Station "trip"/outage during "normal" generation. Given the Licensee's recent operational history of varying generating flows, "normal" is a bit vague! It appears station flows were at 2200 cfs at the time of the trip/outage study. During the weeks prior to October 5th McKay Station flows ran as low as 1100 cfs for a two day period including September 29th (archival data are not available). These flows effectively dewatered aquatic habitat above the 1100 cfs flow level. Unless the Licensee can produce peer reviewed publications that prove aquatic communities can recolonize dewatered shoreline habitats during a six-day period of reduced biological activity, the study results apply only to the aquatic zone below the 1100 cfs shoreline elevation set by the late September two day low flow.

The Ripogenus Project was within normal "rule curve" storage (see 1992 FERC Application) limits during September. There was no biological need to reduce September 2022 flows to the licensed minimum to meet North Twin Impoundment elevation Lake trout spawning goals. Lake trout reproduction is no longer a fisheries MeDIFW management goal.

> *In the February 22, 2022 filing MeDIFW wrote "However, after periodic lake trout monitoring during the early 2000's it was determined wild lake trout reproduction was not occurring in the impoundment. Therefore, Article 408 was amended in 2012 to remove the minimum target lake elevation level during the period August 22 through October 15. With the minimum target lake elevation now removed, MDIFW believes that the Project's seasonal drawdown cycles could have a negative impact on wild landlocked salmon movement, spawning, and incubation within the impoundment and its tributaries*."

Given normal October 2022 Ripogenus storage availability was well within Rule Curve guidance, a pre-study flow of 1100 cfs makes little biological or hydraulic sense and only served to degrade study results.

TU's effort on October 5th produced data of great value to the licensing process. These results demonstrate the loss of small fish, most importantly small salmon, and aquatic insects. TU's October 5th study results provided insight into direct and immediate impacts, stranding, on fish and aquatic communities. The Study requirement and draft study design did not include secondary or delayed impacts caused by flow reductions, namely increased fish movement and commonly referenced increases in insect drift (Cushman, R (1985), Dewson et al (2007), James et al, (2008), Mishal and Winger (1968), Perry and Perry (1986). Displaced aquatic insect that are washed (drift) downstream are lost as a critical food source to fish in the immediate area. The volume of drift and long-term impacts are unknown and need to be defined.

TU's cursory study finding clearly demonstrate the degradation of West Branch fish and aquatic communities resulting from erratic flow management in a river once famous for its landlocked salmon fishery and angler use. Unfortunately, major data gaps remain, namely macro invertrabrate species, seasonal (the date of any outage/"trip" event), baseflow issues and lower river impacts. These gaps need to be addressed.

TU's preliminary study findings clearly established the impact of outage/trip flow on West Branch fish and aquatic communities. There is now a well-documented need for higher minimum base flows, ramping and an increase in outage/"trip" flow protection. Current peaking flows and station outage/"trip" events degrade all aquatic communities in the 21 mile reach and impact MeDIFW's fisheries management goals. The new License and accompanying 401 WQC will include provisions that will affect the biological communities and recreational activities of the entire 21-mile stretch of river and will not be limited to the single 5-mile reach observed in the October 5, 2022 study.

The Licensee's June 2021 Preliminary Application boasts of Protection, Enhancement and Mitigation Measures. There is little evidence that the Licensee has adhered to

these claims. FERC should act in any manner possible, now and in the future, to protect the 21-mile West Branch fish and aquatic resources. A balancing of the resources is needed.

Thank you for the opportunity to comment on this process.

Ed Spear

307 Mt Hope Ave
Bangor, Me 04401
Phone 207-217-4288
Email: edspear1@yahoo.com

CC: Alicia Burtner

Literature Cited

**Cushman, R. M., Review of ecological effects of rapidly varying flows downstream from hydroelectric facilities. 1985. N Am J Fish Management 5:330–339**

**Dewson, Zoe. S, Alexander B. W. James, and Russell G. Death (2007), A review of the consequences of decreased flow for instream habitat and macroinvertebrates Journal of the North American Benthological Society, 26:3, 401-415**

**James, A.B.W, Dewson, Z.S. and Death, R.G. (2008), The effect of experimental flow reductions on macroinvertebrate drift in natural and streamside channels. River Res. Applic., 24: 22-35.**

**Mishal, G.W. and Winger, P.V. (1968), The Effect of Reduction in Stream Flow on Invertebrate Drift. Ecology, 49: 580-582.**

**Perry, S.A., Perry, W.B., Effects of experimental flow regulation on invertebrate drift and stranding in the Flathead and Kootenai Rivers, Montana, USA. Hydrobiologia 134, 171–182 (1986).**

# United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Maine-New Hampshire Fish and Wildlife Service Complex
Ecological Services
Maine Field Office
P.O. Box A
306 Hatchery Road
East Orland, Maine 04431
207/469-7300 Fax: 207/902-1588

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E
Washington, DC 20426

November 15, 2022

**RE: Downstream Eel Passage Standard - Maine**

Dear Secretary Bose,

On May 23, 2017, the Department of the Interior, through the United States Fish and Wildlife Service (Service) submitted its Preliminary Prescription for Fishways (Prescription)[1] for the Mattaceunk Hydroelectric Project (Project; FERC No. 2520) and finalized that Prescription on June 27, 2018.[2] On February 26, 2021, the Federal Energy Regulatory Commission (FERC; Commission) issued a new license (License) for the Project.[3] The Prescription's fish passage conditions, required by Ordering Paragraph (E), are attached as Appendix B to the License.

Section 12.2.2 of the Prescription states, "The Licensee shall operate the Project to exceed the minimum downstream survival efficiency criterion of 76 percent of the adult (i.e., silver) American eel moving downstream past the Project." This survival efficiency criterion is based upon the Sweka et al. (2014) American eel egg-per-recruit (EPR) model (Model)[4] which indicates that cumulative silver eel survival passing three to four dams must exceed a minimum of 76 percent at each dam and must be higher to rebuild the American eel population. However, the Service recently received information that the referenced model does not apply to the

[1] Accession No. 20170523-5083.
[2] Accession No. 20180627-5030.
[3] 174 FERC ¶ 62,135
[4] Sweka, J. A., Eyler, S., and Millard, M. J. 2014. An egg-per-recruit model to evaluate the effects of upstream transport and downstream passage mortality of American eel in the Susquehanna River. *North American Journal of Fisheries Management*, 34:764-773.

Penobscot River, for the reasons described by the model's developer in the attached memo (Attachment A).

Therefore, the Service is notifying the Commission that the Model was parameterized specifically for the Susquehanna River and model results cannot be directly applied to the development of passage standards at any facilities outside of the Susquehanna River watershed.[5]

If you have any questions, please contact Julianne Rosset of this office at julianne_rosset@fws.gov.

Sincerely,

AMANDA CROSS Digitally signed by AMANDA CROSS Date: 2022.11.15 16:36:53 -05'00'

Amanda S, Cross, Ph.D.
Project Leader
Maine Field Office
Maine-New Hampshire
Fish and Wildlife Service Complex

cc: PIN, Dan McCaw
NMFS, Jeff Murphy
MEDEP, Kyle Olcott
MEDMR, Casey Clark
MEDIFW, John Perry, Kevin Dunham
RO/Fisheries, Bryan Sojkowski
ES, JRosset:9-30-22: (207)-298-3080

[5] This letter will be filed on FERC online for each hydropower project in the state of Maine.

United States Department of the Interior
FISH AND WILDLIFE SERVICE
NORTHEAST FISHERY CENTER
P.O. Box 75
308 Washington Avenue
Lamar, Pennsylvania 16848
(570) 726-4247

Date: 5/11/22
To: Julianne Rosset
From: John Sweka and Sheila Eyler
RE: Application of the Sweka et al. (2014) American eel EPR model to the Penobscot River

Dear Ms. Rosset,

The use of the Sweka et al. (2014) American eel egg-per-recruit (EPR) model to prescribe a minimum downstream passage survival for eels of 76 percent at Mattaceunk Hydroelectric Project (FERC No. 2520) on the Penobscot River represents a misuse of model results.

The model was designed to determine a level of downstream survival for American eels to ensure that the overall reproductive potential for eels emigrating from the Susquehanna River would not be reduced during silver eel migration if eels were passed upstream of hydroelectric projects. The published model was specific to the situation on the Susquehanna River in which American eels are captured at the first dam on the river (Conowingo Dam, P-405) and trucked upstream of the other four hydroelectric projects: Muddy Run Pumped Storage Station (P-2355), Holtwood Dam (P-1881), Safe Harbor Dam (P-1025), and York Haven Dam(P-1888). The model assumed that any migrating silver eels originated from either below Conowingo or above York Haven Dam, and no eels matured to the silver stage between dams. Because American eels have been precluded from passing above the four mainstem dams on the Susquehanna River for many decades, contemporary life history parameters for American eels in the Susquehanna do not exist and the model was largely theoretical in nature and borrowed life history parameters documented in scientific literature from other river systems. Given the life history parameters used and spatial structure of the hydroelectric projects on the Susquehanna River, Sweka et al. (2014) determined a "break-even threshold" cumulative downstream passage survival of 33 percent was needed. At this level, passing eels upstream resulted in the same EPR as not passing eels upstream of Conowingo Dam. Higher cumulative downstream passage survival would result in a higher EPR. The 33 percent "break-even threshold" is specific to the Susquehanna River and the life history parameters used in the modeling of that situation and should be considered a minimum level to ensure additional harm to the population is avoided. Something greater than the "break-even threshold" is needed to increase the population.

In the discussion section of the Sweka et al. (2014) paper (page 771), the authors describe the sensitivity of model results to the input parameters and the effect these input parameters would have on the "break-even threshold." Differences in growth, natural mortality, and the proportions of eels that become female in river reaches above dams compared to reaches below dams will have a large effect on the location of the "break-even threshold". Appropriate application of this model to other systems requires updating the life history parameters to be

specific to the river system in question because of their large effect on model results.

As stated by Sweka et al. (2014), "If emigrating American eels are required to pass more hydroelectric facilities, the downstream passage survival at each hydroelectric facility will need to increase in order to realize any reproductive benefit from upstream passage or transport." The Susquehanna River was very simple to model with only five hydroelectric projects in succession and those projects in relatively close proximity on the lower mainstem of the river. However, the spatial structure of the Penobscot River is more complicated with more hydroelectric dams in the watershed, the dams spread over larger distances, and the dams located on multiple tributaries within the watershed. Additionally, eels are not trucked from the first dam on the Penobscot, upstream of all of the other dams. This complicated spatial structure would result in different portions of the silver eel population encountering different numbers of dams during migration. Thus, a spatial structure that more accurately reflects the Penobscot River would need to be incorporated into the model before it could be used to make a downstream passage survival criterion at a specific hydroelectric project in that system.

In conclusion, the modeling framework by Sweka et al. (2014) can be useful in determining passage criteria. However, direct application of the "break-even threshold" of 33 percent cumulative downstream passage survival to other river systems represents a misuse of the model. If emigrating silver eels only need to pass four dams, each with 76 percent downstream passage efficiency, and the life history of American eels was the same as that modeled in the Susquehanna River, then the 33 percent cumulative downstream passage target (0.76 x 0.76 x 0.76 x 0.76 = 0.33) would be appropriate. However, there are more than four dams on the Penobscot River through which silver eels need to pass, and life history of American eels in the Penobscot River likely differs from those modeled on the Susquehanna River. Differences between the Susquehanna River and the Penobscot River were not considered when recommending the 76 percent downstream passage target for the Mattaceunk Project. Therefore, use of the 76 percent downstream passage target in for the Mattaceunk Project is not appropriate. The intent of the Sweka et al. (2014) paper was to present a model that could be adapted to other rivers, not to present a downstream passage survival criterion to be used in other rivers. Modification of the model in terms of life history input parameters and spatial structure is necessary when applying the modeling methodology to other rivers.

Sincerely,

John Sweka and Sheila Eyler

Document Accession #: 20230110-0007 Filed Date: 01/10/2023

ORIGINAL

**Brookfield**
**Renewable**

FILED
SECRETARY OF THE
COMMISSION

2023 JAN 10 P 3:19

FEDERAL ENERGY
REGULATORY COMMISSION

January 4, 2023

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Proposed Modification to Relicensing Schedule**

Dear Stakeholder:

Great Lakes Hydro America, LLC (GLHA), Licensee of the Ripogenus Hydroelectric Project (FERC No. 2572) and the Penobscot Mills Hydroelectric Project (FERC No. 2458) (collectively referred to as the "Projects"), is proposing to modify the Projects' relicensing schedule (i.e., revert back to the Projects' original relicensing schedule). The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot counties, Maine.

The current licenses for the Projects were issued on October 22, 1996 and expire on September 30, 2026. On June 11, 2021, GLHA filed the Notices of Intent and Pre-Application Document (PAD), which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through the Federal Energy Regulatory Commission's (FERC) Integrated Licensing Process (ILP). In support of the relicensing process and consistent with FERC's ILP schedule, on March 23, 2022, GLHA filed a Revised Study Plan (RSP) for the Projects.

Pursuant to 18 CFR 5.13(c) and consistent with the Projects' process plan and schedule, FERC was to issue the Study Plan Determination within 30 days of the RSP filing (i.e., April 22, 2022) and subsequently, the Initial Study Report (ISR) was to be filed with FERC within 1 year of the Study Plan Determination (i.e., April 22, 2023). However, via letter dated April 7, 2022, the Projects' original relicensing schedule was modified by FERC to accommodate stakeholders' requests for additional time to file comments on the RSP. Therefore, FERC issued the Study Plan Determination for the Projects on May 13, 2022, which indicated that the ISR shall be filed with FERC by May 13, 2023.

Based on this revised ISR filing date of May 13, 2023, the subsequent deadline for additional or modified study requests and potential disputes would not be complete until September 10, 2023. Recognizing the potential implications this schedule could have on GLHA's ability to conduct second year studies in 2023, GLHA proposes to modify the project schedule to file the ISR by April 22, 2023 (i.e., the original process plan and schedule presented in the PAD and FERC's Scoping Document 2) as well as the subsequent due dates as defined by 18 CFR 5.15(c). A summary of the current and proposed (i.e., original) schedule associated with the ISR and subsequent due dates is provided for reference in the table below.

Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462
www.brookfieldrenewable.com
Tel: 207.723.4341
Fax: 207.723.3948

| Activity | Responsible Party | Timeframe | Current Due Date | Proposed (Original) Due Date |
|---|---|---|---|---|
| File ISR | Licensee | Within 1 year of 1st Study Plan Determination | May 13, 2023 | April 22, 2023 |
| Conduct ISR Meeting | Licensee | Within 15 days of ISR filing | May 28, 2023 | May 7, 2023 |
| File ISR Meeting Summary | Licensee | Within 15 days of ISR Meeting | June 12, 2023 | May 22, 2023 |
| File comments on ISR, ISR Meeting Summary, and new study requests | Stakeholders | Within 30 days of ISR Meeting Summary filing | July 12, 2023 | June 21, 2023 |
| File response to comments on ISR, ISR Meeting Summary, and new study requests | Licensee | Within 30 days of filing of comments and new study requests | August 11, 2023 | July 21, 2023 |
| Issue 2nd Study Plan Determination (if necessary) | FERC | Within 30 days of filing of response to comments and new study requests | September 10, 2023 | August 20, 2023 |

Whereas FERC's April 7, 2022 modification of the relicensing schedule provided stakeholders with additional time to provide comments on the RSP, we now have the opportunity to follow the original relicensing schedule. GLHA believes that reverting back to the Projects' original relicensing schedule will be beneficial to all the relicensing parties; including providing the ISR and holding the ISR Meeting earlier this Spring.

However, if there are any comments or concerns regarding this request, GLHA asks that you provide written comments via email to Cate Russell at cate.russell@hdrinc.com or via mail to 970 Baxter Blvd, Suite 301, Portland, ME 04103 by January 25, 2023. Subsequently, GLHA will file with FERC a request to revert back to the original ILP schedule along with any comments received.

We appreciate your consideration of this schedule change and look forward to working with you on 2023 relicensing activities.

Sincerely,

Randall Dorman
Licensing Manager
Brookfield Renewable

cc: Projects' Relicensing Distribution List

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

## Federal Agencies

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Stephanie Carman
Acting District Manager
Northeastern States
Bureau of Land Management
626 E. Wisconsin Avenue, Suite 200
Milwaukee, WI 53202-4617

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Kimberly Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Deborah Szaro
New England Region 1
Regional Administrator (Acting)
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

## State Agencies

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Kyle Olcott
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

## Municipalities and Government Officials

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Peter Jamieson
Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
40 Western Avenue
E.S. Muskie Federal Building, Room 412
Augusta, ME 04330

Kathy Irene Javner
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, Maine 04333

## Native American Tribes

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Rena Newell
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

## Additional Parties

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground
ssindo@chewonki.org

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund
sperry@maine.com

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Emily Crowley
Curtis Thaxter
PO Box 7320
Portland, ME 04112-7320

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

# Ripogenus Hydroelectric Project (FERC No. 2572)
# Penobscot Mills Hydroelectric Project (FERC No. 2458)
# Distribution List

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Kelly Maloney
Manager
Great Lakes Hydro America LLC
150 Main Street
Lewiston, ME 04240

Jesika Lucarelli
Great Mountain Guide Service
greatmountaings@gmail.com

John Dicentes
President
International Association of Machinists
64 Congress Street
Millinocket, ME 04462-1312

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Director
Maine Professional River Outfitters
PO Box 669
Millinocket, ME 04462-0669

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing
mary@mxhmarketing.com

# Ripogenus Hydroelectric Project (FERC No. 2572)
# Penobscot Mills Hydroelectric Project (FERC No. 2458)
# Distribution List

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Allison Econbmy
Representative for Allagash Gateway Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Thomas Nannery
Sportsman's Alliance of Maine
205 Church Hill Rd
Augusta, ME 04330-9801

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Jeffrey Reardon
Maine Brook Trout Project Director
Trout Unlimited
267 Scribner Hill Road
Manchester, ME 04351

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,
sharon.klein@maine.edu

Jeff Fayle
jfayle@gmail.com

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti
granby@cox.net

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris
nsharris@mgh.harvard.edu

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Charles Paone
cpaonejr@gmail.com

Richard Parkes
Rparkesbb3@yahoo.com

Edward Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Robert Van Deventer
bobvnert@gmail.com

Wes Zemrak
2 Brookside Drive
Falmouth, ME 04105

Ms. Kimberly D. Bose January 18, 2022
Secretary,
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426. VIA Electronic Filing

**Reference:** Ripogenus Hydroelectric Project (FERC No. 2572-133)
Penobscot Mills Hydroelectric Project (FERC No. 2458-247)

Subject: Opposition to the Licensee's January 4, 2023 letter Proposing a Modification to the combined Project's Relicensing Schedule.

On January 4, 2023 the Licensee requested that the Initial Study Report, associated reports and meeting (s) deadlines be moved forward by approximately one month. Given the time needed to prepare for the next stages of licensing and other scheduling conflicts, this request places and undo burden on the agencies, FERC and perhaps most importantly, the stakeholders. In a September 17, 2021 filing, the Licensee denied an agency and stakeholder request for a 90-day extension. The Licensee now wishes to further reduce the review period. Any scheduling changes during a process that will produce a 30-year license seems both an unnecessary and an unfair burden on the stakeholders.

Licensing events are intended as a collaborated process. The stakeholders are still waiting to be "collaborated with". I have seen no preliminary or final reports concerning fisheries or aquatic communities. Any sharing of field study information would make the stakeholders feel "they were part of the process". If the Licensee wants the opportunity to perform anticipated studies early in the upcoming field season, releasing fisheries and aquatic communities 2022 data collections as well as studies from other guilds would speed up that process.

For the above reasons, I urge FERC to maintain the schedule shown on Table 3.1-1 of the June 11, 2021 Pre Application Document.

Thank you for the opportunity to comment.

Ed Spear

307 Mt Hope Ave.
Bangor, Me 04401
Email: edspear1@yahoo.com
Phone: 207-217-4288

Brookfield
Renewable

January 27, 2023

***Via eFiling***

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Proposed Modification to Relicensing Schedule**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), Licensee of the Ripogenus Hydroelectric Project (FERC No. 2572) and the Penobscot Mills Hydroelectric Project (FERC No. 2458) (collectively referred to as the "Projects"), herein files a request to modify the Projects' relicensing schedule. The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot counties, Maine.

The current licenses for the Projects were issued on October 22, 1996 and expire on September 30, 2026. On June 11, 2021, GLHA filed the Notices of Intent and Pre-Application Document (PAD), which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through the Federal Energy Regulatory Commission's (FERC) Integrated Licensing Process (ILP). On March 23, 2022, GLHA filed a Revised Study Plan (RSP) for the Projects.

Pursuant to 18 CFR 5.13(c) and as indicated in the Projects' process plan and schedule provided in the PAD, FERC shall issue the Study Plan Determination within 30 days of the RSP filing (i.e., April 22, 2022) and subsequently, the Initial Study Report (ISR) shall be filed with FERC within 1 year of the Study Plan Determination (i.e., April 22, 2023). However, via letter dated April 7, 2022, this schedule was modified by FERC to accommodate stakeholders' requests for additional time to file comments on the RSP. Therefore, FERC issued the Study Plan Determination for the Projects on May 13, 2022, which indicated that the ISR shall be filed with FERC by May 13, 2023.

Based on an ISR filing date of May 13, 2023, the subsequent deadline for additional or modified study requests and potential disputes would not be complete until September 10, 2023. Recognizing the potential implications this schedule could have on GLHA's ability to conduct second year studies in 2023, GLHA proposes to modify the Project schedule to file the ISR by April 22, 2023 (i.e., the original process plan and schedule date provided in the PAD and indicated in FERC's Scoping Document 2) as well as the subsequent due dates as defined by 18 CFR 5.15(c). A summary of the current and proposed (i.e., original) schedule associated with the ISR and subsequent due dates is provided for reference in the following table.

| Activity | Responsible Party | Timeframe | Current Due Date | Proposed (Original) Due Date |
|---|---|---|---|---|
| File ISR | Licensee | Within 1 year of 1st Study Plan Determination | May 13, 2023 | April 22, 2023 |
| Conduct ISR Meeting | Licensee | Within 15 days of ISR filing | May 28, 2023 | May 7, 2023 |
| File ISR Meeting Summary | Licensee | Within 15 days of ISR Meeting | June 12, 2023 | May 22, 2023 |
| File comments on ISR, ISR Meeting Summary, and new study requests | Stakeholders | Within 30 days of ISR Meeting Summary filing | July 12, 2023 | June 21, 2023 |
| File response to comments on ISR, ISR Meeting Summary, and new study requests | Licensee | Within 30 days of filing of comments and new study requests | August 11, 2023 | July 21, 2023 |
| Issue 2nd Study Plan Determination (if necessary) | FERC | Within 30 days of filing of response to comments and new study requests | September 10, 2023 | August 20, 2023 |

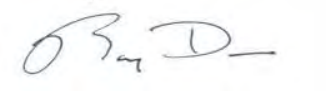
Whereas FERC's April 7, 2022 modification of the relicensing schedule provided stakeholders with additional time to provide comments on the RSP, we now have the opportunity to follow the original relicensing schedule. GLHA believes that reverting back to the Projects' original relicensing schedule will be beneficial to all the relicensing parties, including providing the ISR and holding the ISR Meeting earlier this spring.

In support of this request, via letter dated January 4, 2023, GLHA notified all stakeholders on the relicensing distribution list of the proposed modification to the relicensing schedule and requested any comments be provided by January 25, 2023. In addition, a copy of the letter was filed on the Projects' eLibrary dockets.

Via email dated January 20, 2023, the Maine Department of Environmental Protection indicated that the Department had no objection to the proposed schedule. Additionally, on January 18, 2023, Mr. Edward Spear provided FERC with comments on GLHA's request via eComment. Within Mr. Spear's comments is his support for the relicensing schedule outlined in the PAD. No other comments on the proposed schedule were received by GLHA. Copies of the aforementioned correspondence are enclosed.

If you have any questions regarding this letter, please contact me by phone at (207) 775-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman, Licensing Manager
Brookfield Renewable

cc: Relicensing Distribution List

Enclosures

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

## Federal Agencies

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Stephanie Carman
Acting District Manager
Northeastern States
Bureau of Land Management
626 E. Wisconsin Avenue, Suite 200
Milwaukee, WI 53202-4617

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Kimberly Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Deborah Szaro
New England Region 1
Regional Administrator (Acting)
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

## State Agencies

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Kyle Olcott
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

## Municipalities and Government Officials

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Peter Jamieson
Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
40 Western Avenue
E.S. Muskie Federal Building, Room 412
Augusta, ME 04330

Kathy Irene Javner
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, Maine 04333

## Native American Tribes

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Rena Newell
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

## Additional Parties

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground
ssindo@chewonki.org

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund
sperry@maine.com

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Emily Crowley
Curtis Thaxter
PO Box 7320
Portland, ME 04112-7320

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Kelly Maloney
Manager
Great Lakes Hydro America LLC
150 Main Street
Lewiston, ME 04240

Jesika Lucarelli
Great Mountain Guide Service
greatmountaings@gmail.com

John Dicentes
President
International Association of Machinists
64 Congress Street
Millinocket, ME 04462-1312

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Director
Maine Professional River Outfitters
PO Box 669
Millinocket, ME 04462-0669

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing
mary@mxhmarketing.com

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Allison Economy
Representative for Allagash Gateway Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Thomas Nannery
Sportsman's Alliance of Maine
205 Church Hill Rd
Augusta, ME 04330-9801

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Jeffrey Reardon
Maine Brook Trout Project Director
Trout Unlimited
267 Scribner Hill Road
Manchester, ME 04351

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,
sharon.klein@maine.edu

Jeff Fayle
jfayle@gmail.com

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti
granby@cox.net

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris
nsharris@mgh.harvard.edu

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Charles Paone
cpaonejr@gmail.com

Richard Parkes
Rparkesbb3@yahoo.com

Edward Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Robert Van Deventer
bobvnert@gmail.com

Wes Zemrak
2 Brookside Drive
Falmouth, ME 04105

# CORRESPONDENCE RECORD

Brookfield Renewable

January 4, 2023

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Proposed Modification to Relicensing Schedule**

Dear Stakeholder:

Great Lakes Hydro America, LLC (GLHA), Licensee of the Ripogenus Hydroelectric Project (FERC No. 2572) and the Penobscot Mills Hydroelectric Project (FERC No. 2458) (collectively referred to as the "Projects"), is proposing to modify the Projects' relicensing schedule (i.e., revert back to the Projects' original relicensing schedule). The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot counties, Maine.

The current licenses for the Projects were issued on October 22, 1996 and expire on September 30, 2026. On June 11, 2021, GLHA filed the Notices of Intent and Pre-Application Document (PAD), which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through the Federal Energy Regulatory Commission's (FERC) Integrated Licensing Process (ILP). In support of the relicensing process and consistent with FERC's ILP schedule, on March 23, 2022, GLHA filed a Revised Study Plan (RSP) for the Projects.

Pursuant to 18 CFR 5.13(c) and consistent with the Projects' process plan and schedule, FERC was to issue the Study Plan Determination within 30 days of the RSP filing (i.e., April 22, 2022) and subsequently, the Initial Study Report (ISR) was to be filed with FERC within 1 year of the Study Plan Determination (i.e., April 22, 2023). However, via letter dated April 7, 2022, the Projects' original relicensing schedule was modified by FERC to accommodate stakeholders' requests for additional time to file comments on the RSP. Therefore, FERC issued the Study Plan Determination for the Projects on May 13, 2022, which indicated that the ISR shall be filed with FERC by May 13, 2023.

Based on this revised ISR filing date of May 13, 2023, the subsequent deadline for additional or modified study requests and potential disputes would not be complete until September 10, 2023. Recognizing the potential implications this schedule could have on GLHA's ability to conduct second year studies in 2023, GLHA proposes to modify the project schedule to file the ISR by April 22, 2023 (i.e., the original process plan and schedule presented in the PAD and FERC's Scoping Document 2) as well as the subsequent due dates as defined by 18 CFR 5.15(c). A summary of the current and proposed (i.e., original) schedule associated with the ISR and subsequent due dates is provided for reference in the table below.

Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462
www.brookfieldrenewable.com
Tel: 207.723.4341
Fax: 207.723.3948

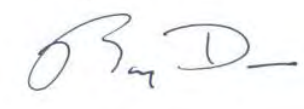
| Activity | Responsible Party | Timeframe | Current Due Date | Proposed (Original) Due Date |
|---|---|---|---|---|
| File ISR | Licensee | Within 1 year of 1st Study Plan Determination | May 13, 2023 | April 22, 2023 |
| Conduct ISR Meeting | Licensee | Within 15 days of ISR filing | May 28, 2023 | May 7, 2023 |
| File ISR Meeting Summary | Licensee | Within 15 days of ISR Meeting | June 12, 2023 | May 22, 2023 |
| File comments on ISR, ISR Meeting Summary, and new study requests | Stakeholders | Within 30 days of ISR Meeting Summary filing | July 12, 2023 | June 21, 2023 |
| File response to comments on ISR, ISR Meeting Summary, and new study requests | Licensee | Within 30 days of filing of comments and new study requests | August 11, 2023 | July 21, 2023 |
| Issue 2nd Study Plan Determination (if necessary) | FERC | Within 30 days of filing of response to comments and new study requests | September 10, 2023 | August 20, 2023 |

Whereas FERC's April 7, 2022 modification of the relicensing schedule provided stakeholders with additional time to provide comments on the RSP, we now have the opportunity to follow the original relicensing schedule. GLHA believes that reverting back to the Projects' original relicensing schedule will be beneficial to all the relicensing parties, including providing the ISR and holding the ISR Meeting earlier this Spring.

However, if there are any comments or concerns regarding this request, GLHA asks that you provide written comments via email to Cate Russell at cate.russell@hdrinc.com or via mail to 970 Baxter Blvd, Suite 301, Portland, ME 04103 by January 25, 2023. Subsequently, GLHA will file with FERC a request to revert back to the original ILP schedule along with any comments received.

We appreciate your consideration of this schedule change and look forward to working with you on 2023 relicensing activities.

Sincerely,



Randall Dorman
Licensing Manager
Brookfield Renewable

cc: Projects' Relicensing Distribution List

Ms. Kimberly D. Bose January 18, 2022
Secretary,
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426. VIA Electronic Filing

**Reference:** Ripogenus Hydroelectric Project (FERC No. 2572-133)
Penobscot Mills Hydroelectric Project (FERC No. 2458-247)

Subject: Opposition to the Licensee's January 4, 2023 letter Proposing a Modification to the combined Project's Relicensing Schedule.

On January 4, 2023 the Licensee requested that the Initial Study Report, associated reports and meeting (s) deadlines be moved forward by approximately one month. Given the time needed to prepare for the next stages of licensing and other scheduling conflicts, this request places and undo burden on the agencies, FERC and perhaps most importantly, the stakeholders. In a September 17, 2021 filing, the Licensee denied an agency and stakeholder request for a 90-day extension. The Licensee now wishes to further reduce the review period. Any scheduling changes during a process that will produce a 30-year license seems both an unnecessary and an unfair burden on the stakeholders.

Licensing events are intended as a collaborated process. The stakeholders are still waiting to be "collaborated with". I have seen no preliminary or final reports concerning fisheries or aquatic communities. Any sharing of field study information would make the stakeholders feel "they were part of the process". If the Licensee wants the opportunity to perform anticipated studies early in the upcoming field season, releasing fisheries and aquatic communities 2022 data collections as well as studies from other guilds would speed up that process.

For the above reasons, I urge FERC to maintain the schedule shown on Table 3.1-1 of the June 11, 2021 Pre Application Document.

Thank you for the opportunity to comment.

Ed Spear

307 Mt Hope Ave.
Bangor, Me 04401
Email: edspear1@yahoo.com
Phone: 207-217-4288

## Russell, Cate

**From:** Olcott, Kyle <Kyle.Olcott@maine.gov>
**Sent:** Friday, January 20, 2023 9:10 AM
**To:** Russell, Cate
**Cc:** Dorman, Randy; Gibson, Jim; Wendy Bley
**Subject:** RE: Ripogenus & Penobscot Mills Hydroelectric Projects: Relicensing Schedule

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

DEP has no objections to the proposed modification to the relicensing schedule.

Kyle Olcott
Hydropower Coordinator
Bureau of Land Resources
Maine Department of Environmental Protection
207 641 9012

---

**From:** Russell, Cate <Cate.Russell@hdrinc.com>
**Sent:** Thursday, January 5, 2023 10:02 AM
**To:** Russell, Cate <cate.russell@hdrinc.com>
**Cc:** Dorman, Randy <Randy.Dorman@brookfieldrenewable.com>; Gibson, Jim <jim.gibson@hdrinc.com>; Wendy Bley <wendy.bley@kleinschmidtgroup.com>
**Subject:** Ripogenus & Penobscot Mills Hydroelectric Projects: Relicensing Schedule

**EXTERNAL: This email originated from outside of the State of Maine Mail System. Do not click links or open attachments unless you recognize the sender and know the content is safe.**
Dear Stakeholders –

The Ripogenus Hydroelectric Project (FERC No. 2572) and the Penobscot Mills Hydroelectric Project (FERC No. 2458), located on the West Branch of the Penobscot River in Piscataquis and Penobscot Counties, Maine, are currently licensed with the Federal Energy Regulatory Commission (FERC). On June 11, 2021, the licensee, Great Lakes Hydro America, LLC (GLHA), a subsidiary of Brookfield Renewable, initiated the federal relicensing process with the filing of the Notices of Intent (NOIs) and a Pre-Application Document (PAD) for these facilities.

On behalf of GLHA, attached is a letter describing GLHA's proposal to modify the Projects' relicensing schedule by reverting back to the Projects' original relicensing schedule.

Given that our contact database includes your email address, we are providing a copy of this letter via email, in lieu of a direct mailing. If you would like to receive paper copies of future letters, as compared to emails, please contact Cate Russell with HDR at cate.russell@hdrinc.com or (207) 239-3792.

Sincerely,

Cate Russell
*Associate, Regulatory and Environmental Section Manager*
HDR
970 Baxter Blvd, Suite 301
Portland, ME 04103

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

| | |
|---|---|
| Brookfield White Pine Hydro LLC, | Project Nos. 2283-064 |
| Black Bear Hydro Partners, LLC, | 2325-007 |
| Merimil Limited Partnership, Brassua | 2329-086 |
| Hydroelectric Limited Partnership, Eagle | 2335-046 |
| Creek Kennebec Hydro, LLC, Kennebec | 2519-003 |
| Water Power Company, Black Bear SO, LLC, | 2527-002 |
| Black Bear Development Holdings, LLC, | 2528-066 |
| Great Lakes Hydro America, LLC | 2529-005 |
| | 2534-005 |
| | 2612-029 |
| | 2615-048 |
| | 2671-050 |
| | 2712-004 |
| | 2458-176 |
| | 2572-116 |

ORDER GRANTING EXTENSION OF TIME FOR RECREATION MONITORING AND REPORTING

(Issued February 16, 2023)

1. On February 3, 2023, Brookfield Renewable (Brookfield) filed a request to extend the due dates to conduct recreation monitoring and file recreation reports for various projects located in Maine.[1]

[1] Brookfield Renewable filed its request on behalf of Brookfield White Pine Hydro, LLC for the Gulf Island-Deer Rips Project No. 2283, Weston Project No. 2325, Wyman Project No. 2329, Williams Project No. 2335, North Gorham Project No. 2519, Skelton Project No. 2527, Cataract Project No. 2528, Bonny Eagle Project No. 2529, and Flagstaff Project No. 2612; Black Bear Hydro Partners, LLC for the Milford Project No. 2534; Brookfield White Pine Hydro LLC, Merimil Limited Partnership, Brassua Hydroelectric Limited Partnership, and Eagle Creek Kennebec Hydro, LLC for the Brassua Project No. 2615; Kennebec Water Power Company for the Moosehead Project No. 2671; Black Bear Hydro Partners, LLC, Black Bear SO, LLC, and Black Bear Development Holdings, LLC for the Stillwater Project No. 2712: and Great Lakes Hydro

2. Each license requires the licensee to monitor recreation use and file a report on a six-year cycle (i.e., monitoring in 2020 and filing a report by April 1, 2021) pursuant to the following license articles: Gulf Island-Deer Rips – Article 411, Weston – Article 406, Wyman – Article 411, Williams – Article 406, North Gorham – Article 407, Skelton – Article 413, Cataract – Article 407, Bonny Eagle – Article 412, Milford – Article 414, Flagstaff – Article 410, Brassua – Article 407, Moosehead – Article 412, Stillwater – Article 411, Penobscot Mills – Article 415, and Ripogenus – Article 411. Commission staff issued previous extensions of time to conduct recreation monitoring and reporting due to concerns that recreation use would not be representative of typical recreation seasons due to impacts associated with the COVID-19 pandemic. On March 3, May 14, and September 28, 2021, the due date to file reports on recreation monitoring was extended to April 1, 2023 for all projects.

3. Brookfield requests a 60-day extension to complete recreation monitoring and to file the recreation reports due to unseasonably warm temperatures and lack of snow impacting winter recreational use activities for the Gulf Island-Deer Rips, Weston, Wyman, Williams, North Gorham, Skelton, Cataract, Bonny Eagle, Milford, Flagstaff, Brassua, Moosehead, and Stillwater projects. Brookfield would continue monitoring through the end of March 2023, with the expectation that colder temperatures and more typical winter conditions would provide a more accurate representation of typical use levels. Brookfield acknowledges that use estimates would not be typical of total recreational use due to the delay of winter conditions, but extending the monitoring period through March 2023, would allow for capturing average daily use and peak use under winter conditions.

4. As part of the relicensing process, Commission staff in the Division of Hydropower Licensing issued a study plan determination on May 13, 2022, requiring an inventory, condition assessment, recreation use estimates, user surveys, and boat launch accessibility evaluation for the Penobscot Mills and Ripogenus projects. Brookfield states the study report for the two projects is consistent with the requirements of license (Articles 415 and 411 respectively) and the report would be filed by April 22, 2023.

5. Brookfield's requests provide adequate justification for the extensions of time to complete recreation monitoring and file the required recreation reports and should be granted. The new due date to file recreation reports for the Penobscot Mills and Ripogenus project is April 22, 2023 and June 1, 2023 for the remaining projects.

The Director orders:

(A) Great Lakes Hydro America, LLC's February 3. 2023 extension of time

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America, LLC for the Penobscot Mills Project No. 2458 and Ripogenus Project No. 2572.

request to file recreation monitoring reports for the Penobscot Mills Hydroelectric Project No. 2458 and Ripogenus Hydroelectric Project No. 2572 is granted. The new date to file the recreation monitoring reports is April 22, 2023.

(B) Brookfield White Pine Hydro LLC, Black Bear Hydro Partners, LLC, Merimil Limited Partnership, Brassua Hydroelectric Limited Partnership, Eagle Creek Kennebec Hydro, LLC, Kennebec Water Power Company, Black Bear SO, LLC, Black Bear Development Holdings, LLC's February 3, 2023 extension of time request to complete recreation monitoring and file recreation monitoring reports for the Gulf Island-Deer Rips Project No. 2283, Weston Project No. 2325, Wyman Project No. 2329, Williams Project No. 2335, North Gorham Project No. 2519, Skelton Project No. 2527, Cataract Project No. 2528, Bonny Eagle Project No. 2529, Flagstaff Project No. 2612, Milford Project No. 2534, Brassua Project No. 2615, Moosehead Project No. 2671, Stillwater Project No. 2712 is granted. The new due date to file the recreation monitoring reports is June 1, 2023.

(C) This order constitutes final agency action. Any party may file a request for rehearing of this order within 30 days from the date of its issuance, as provided in section 313(a) of the Federal Power Act, 16 U.S.C. § 825*l*, and the Commission's regulations at 18 C.F.R. § 385.713 (2021). The filing of a request for rehearing does not operate as a stay of the effective date of this order, or of any other date specified in this order. The licensee's failure to file a request for rehearing shall constitute acceptance of this order.

Robert J. Fletcher
Land Resources Branch
Division of Hydropower Administration
and Compliance

FEDERAL ENERGY REGULATORY COMMISSION
Washington, DC 20426
February 17, 2023

OFFICE OF ENERGY PROJECTS

Project Nos. 2572-133 & 2458-247 –
Maine
Ripogenus Hydroelectric Project
Penobscot Mills Hydroelectric Project
Great Lakes Hydro America, LLC

**VIA FERC Service**

Randall Dorman, Licensing Manager, Brookfield Renewable
Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462

**Reference: Revised Process Plan and Schedule**

Dear Mr. Dorman:

On January 27, 2023, Great Lakes Hydro America, LLC (GLHA) filed a request to modify the Process Plan and Schedule for relicensing the Ripogenus (P-2572) and Penobscot Mills (P-2458) Projects (collectively, the Projects). The current schedule includes a deadline of May 13, 2023,[1] for filing the Initial Study Report (ISR). Based on this ISR filing date, the deadline for issuing a Study Plan Modification Determination is September 10, 2023. GLHA states that filing the ISR this late in the year could limit GLHA's ability to conduct any required second year studies in 2023. Therefore, GLHA requests to file the ISR by April 22, 2023.

GLHA's January 27, 2023, filing provides documentation that stakeholders were notified of GLHA's proposal to modify the relicensing schedule. In response to the notification from GLHA, on January 20, 2023, the Maine Department of Environmental Protection responded via email, which is included with GLHA's January 27 filing, indicating that it had no objection to the proposed schedule change. On January 18, 2023, Mr. Edward Spear filed a letter objecting to the proposed schedule modification.

[1] On April 7, 2022, the Commission modified the original Process Plan and Schedule for relicensing activities under the Integrated Licensing Process to accommodate stakeholder requests for additional time to file comments on the Revised Study Plan. Granting this modification moved the deadline for the Study Plan Determination from April 22, 2022, to May 13, 2022.

Mr. Spear states that, given the lack of collaboration in the process, the time needed to prepare for the next stage of relicensing, and scheduling conflicts, the request to modify the schedule places an undue burden on the agencies, Commission staff, and other stakeholders. However, in that letter Mr. Spear also expresses support for, and urged the Commission to maintain, the schedule proposed in the Preliminary Application Document, which is the schedule now proposed by GLHA. No other entity commented on GLHA's proposed schedule modification.

GLHA's proposed modification to the schedule would result in no reduction in stakeholder opportunity for review and comment on the ISR. In addition, the ISR would be filed by GLHA within 1 year of the Commission's approval of the study plan, as required by section 5.15(c) of the Commission's regulations. Modifying the schedule would add a small amount (about 3 weeks) of time to the 2023 study season, particularly following the ISR study modification determination. Though the amount of additional field time would be small, the time would fall in the period from late August through early September, which could provide an opportunity for carrying out studies that require low flow conditions. Therefore, the relicensing schedule for the Projects is modified as follows:

- The ISR is now due by April 22, 2023.
- The ISR meeting must occur by May 7, 2023.
- The ISR meeting summary is now due by May 22, 2023.
- Comments on the ISR, ISR meeting summary, and new study requests are now due by June 21, 2023.
- Response to ISR comments are now due by July 21, 2023.
- Issuance of a Study Plan Modification Determination (if necessary) is now due by August 20, 2023.

If you have questions regarding this matter, you may contact Allan Creamer at (202) 502-8365, or allan.creamer@ferc.gov.

Sincerely,

VINCENT YEARICK

Digitally signed by VINCENT YEARICK
Date: 2023.02.17 12:57:38 -05'00'

Vince Yearick
Director
Division of Hydropower Licensing

March 28, 2023

*Via Electronic Mail*

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commision
888 First Street, NE
Washington, DC 20426

**Subject: Clarification of Request for Extension of Time to File Recreation Monitoring Reports for the Penobscot Mills (FERC No. 2458) and Ripogenus (FERC No. 2572) Projects**

Dear Secretary Bose,

Great Lakes Hydro America, LLC (GLHA), licensee for the Penobscot Mills (FERC No. 2458) and Ripogenus (FERC No. 2572) Projects on the West Branch of the Penobscot River in Maine, respectfully requests a 90-day extension of time (to July 21, 2023) to file documentation of consultation for recreation monitoring reports in order to align with the relicensing schedule.

Article 415 of the Penobscot Mills Project license and Article 411 of the Ripogenus Project license both require a recreation monitoring report, developed in consultation with resource agencies, to be filed every six years to include annual use figures, a discussion of recreation facility adequacy, a description of monitoring methodology, plans for improvement, and documentation of agency consultation. Specifically, both Articles require:

- Documentation of agency consultation and agency comments on the report after it has been prepared and provided to the agencies.
- Specific descriptions of how the agency comments are accommodated by the report.
- A minimum of 30 days for the agencies to comment and to make recommendations prior to filing the report with the Commission.

Both Projects are currently in relicensing, and by letter dated May 13, 2022, the Commission issued its Study Plan Determination for the Projects including a Recreation Study and Whitewater Boating Assessment. The Recreation Study includes an inventory and condition assessment, recreation use estimates, user surveys including recommendations for improvement, and a boat launch accessibility evaluation under various drawdown scenarios. The information being collected is consistent with the requirements of Articles 415 and 411, and, by letter dated February 16, 2023[1], the Commission granted a request filed by GLHA (on

[1] Per FERC Orders dated March 3, 2021 (https://elibrary.ferc.gov/eLibrary/filedownload?fileid=020C072F-66E2-5005-8110-C31FAFC91712) and February 16, 2023 https://elibrary.ferc.gov/eLibrary/filedownload?fileid=AE99011E-ABCF-C405-8F9C-865A5B900001 the current deadline to file these recreation monitoring reports is April 22, 2023.

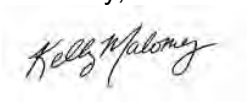
February 3, 2023) to align the reporting requirements under Articles 415 and 411 with the relicensing schedule.

Further clarification of this request, however, is warranted. Specifically, while GLHA's request noted (and the Commission's extension of time approval confirmed) that the Initial Study Report for the Projects would be filed by April 22, 2023, this would not include the required agency review period. Under the current relicensing schedule approved by the Commission by letter dated February 17, 2023, the Initial Study Report meeting for the Projects will be scheduled for not later than May 7, 2023, with the response to agency and stakeholder comments on the Initial Study Report due by July 21, 2023. As such, while the recreation reporting requirements of Articles 415 and 411 will be satisfied by the filing of the Initial Study Report by April 22, 2023, the agency review requirements of Article 415 and 411 would not.

GLHA is therefore clarifying and requesting an amendment to its previous request for an extension of time to July 21, 2023, to file the documentation of agency consultation and description of how agency comments on the Recreation Study are addressed, coinciding with the filing of the Response to Initial Study Report comments pursuant to the Projects' FERC-approved relicensing schedule.

If you have any questions, please contact Allison Frechette at (207) 755-5602 or allison.frechette@brookfieldrenewable.com.

Sincerely,



Kelly Maloney
Senior Manager, Compliance – Northeast

Cc: N. Stevens, J. Seyfried, S. Michaud, E. Deluca, A. Frechette, D. Heidrich, K. Bernier, J. Cole, R. Dorman; GLHA

GLHA Files:
SharePoint GLHA/Licensing & Compliance/Penob Mills 2458/01 Brookfield Corres
SharePoint GLHA/Licensing & Compliance/Ripogenus 2572/01 Brookfield Corres

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

April 5, 2023

Via Electronic filing

**Subject: Response to** Great Lakes Hydro America' s **Request for Extension of Time to File Recreation Monitoring Reports for the Penobscot Mills (FERC No. 2458) and Ripogenus (FERC No. 2572) Projects**

Dear Secretary Bose,

Great Lakes Hydro America, LLC 's (GLHA) March 28, 2023 request for a " me extension for the Recrea" onal Monitoring Reports (Ar" cles 415 and 411 respec" vely) is unwarranted and places an undue burden on the agencies and stakeholders. The Licensee correctly referenced the ongoing licensing(s), and recrea" onal informa" on needs to be made available to par" es interested in these procedures for review, sooner rather than later. The Licensee is a# emp" ng a legal argument against prior scheduling. The Licensee has not made a case as to why this informa" on should be withheld during the forthcoming development of study plans.

While the request to delay Ar" cles 415 and 411 reports has major impacts on boaters, camp owners, campers, and sight-seers' groups; this request also has impacts on agency and stakeholder groups concerned with anglers and angling. Anglers need to be given equal consideraon. T o date, the Licensee has ignored all requests for recreaonal angler surveys.

My interests in these licensing proceedings include fish, aqua" c communi" es, and anglers. Anglers are a major component of the Penobscot Mills and Ripogenus Projects recrea" onal community and the Licensee con" nues to ignore this group. I have seen the recrea" onal survey forms and am appalled by the limited design for the collec" on of angler informaon e.g., use, effort, catch, etc. These data are rounely used to evaluate fisheries and provide insight into the status of (recrea" onal) angler use of the project impoundments and riverine reaches. GLHA con" nues to avoid any meaningful collec" on of angler use and catch data from the projects' impoundments and riverine reaches. Fisheries data are also used in determining water quality standards, e.g., designated uses, an" -degrada" on standards.

My hope is that the **Recreation Monitoring Reports will provide some insight into recreational angler use of project waters. I am not optimistic. Absent useful angler**

**information, the resource agencies and stakeholders will not be able to suggest studies to fill the many data voids. The Recreation Monitoring Reports needs to be available on schedule rather than become part of the Licensee's continuing strategy of withholding information whenever possible.**

**For the reasons stated above, I object to the GLHA's request for a Recreation Monitoring Report(s) time extension. I urge FERC to remain on schedule and make Recreation Monitoring Reports available as scheduled and in a timely manner.**

**Thank you for the opportunity to comment.**

**Edward Spear**

**307 Mt Hope Ave**
**Bangor, Me 04401**
**Email: edspear1@yahoo.com**
**Phone; 207-217-4288**

Brookfield
Renewable U.S.

April 7, 2023

***Via eFiling***

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Advance Courtesy Notice of Initial Study Report Meeting**

Dear Secretary Bose:

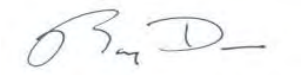
Great Lakes Hydro America, LLC (GLHA), Licensee of the Ripogenus Hydroelectric Project (No. 2572) and the Penobscot Mills Hydroelectric Project (No. 2458) (collectively referred to as the "Projects"), herein files an advance courtesy notification of the dates and location for the upcoming Initial Study Report (ISR) Meeting.

Consistent with the Federal Energy Regulatory Commission's Integrated Licensing Process (ILP), GLHA will be filing and distributing the ISR by April 22, 2023, and conducting the ISR Meeting within 15 days of filing the ISR (before May 7, 2023). GLHA is required in the ISR to provide details regarding the ISR Meeting. However, given that the ISR Meeting will be an ***in-person*** meeting, as compared to a virtual meeting, GLHA is providing an advance courtesy notification of the meeting dates and location.

Given the number of studies to be presented during the ISR Meeting, the meeting will be held over three days, on May 2, 3, and 4, 2023. The meeting will start at each day at 9:00 AM and is anticipated to end each day at 5:00 PM. The meeting will be held ***in-person*** at the Northern Timber Cruisers, Millinocket Snowmobile Club, located at 10 Northern Cruise Trail in Millinocket, Maine 04462. The agenda for the ISR Meeting and an RSVP request will be included in the ISR.

If you have any questions regarding this advance courtesy notification, the ISR, or the ISR Meeting, please contact me by phone at (207) 775-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman, Licensing Manager
Brookfield Renewable

cc: Relicensing Distribution List

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

## Federal Agencies

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Stephanie Carman
Acting District Manager
Northeastern States
Bureau of Land Management
626 E. Wisconsin Avenue, Suite 200
Milwaukee, WI 53202-4617

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Kimberly Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Deborah Szaro
New England Region 1
Regional Administrator (Acting)
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

## State Agencies

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Kyle Olcott
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

## Municipalities and Government Officials

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Peter Jamieson
Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
40 Western Avenue
E.S. Muskie Federal Building, Room 412
Augusta, ME 04330

Kathy Irene Javner
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, Maine 04333

## Native American Tribes

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Rena Newell
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

## Additional Parties

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground
ssindo@chewonki.org

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund
sperry@maine.com

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Emily Crowley
Curtis Thaxter
PO Box 7320
Portland, ME 04112-7320

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Kelly Maloney
Manager
Great Lakes Hydro America LLC
150 Main Street
Lewiston, ME 04240

Jesika Lucarelli
Great Mountain Guide Service
greatmountaings@gmail.com

John Dicentes
President
International Association of Machinists
64 Congress Street
Millinocket, ME 04462-1312

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Director
Maine Professional River Outfitters
PO Box 669
Millinocket, ME 04462-0669

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing
mary@mxhmarketing.com

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Allison Economy
Representative for Allagash Gateway Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Thomas Nannery
Sportsman's Alliance of Maine
205 Church Hill Rd
Augusta, ME 04330-9801

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Jeffrey Reardon
Maine Brook Trout Project Director
Trout Unlimited
267 Scribner Hill Road
Manchester, ME 04351

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,
sharon.klein@maine.edu

Jeff Fayle
jfayle@gmail.com

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti
granby@cox.net

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris
nsharris@mgh.harvard.edu

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Charles Paone
cpaonejr@gmail.com

Richard Parkes
Rparkesbb3@yahoo.com

Edward Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Robert Van Deventer
bobvnert@gmail.com

Wes Zemrak
2 Brookside Drive
Falmouth, ME 04105

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Great Lakes Hydro America, LLC — Project Nos. 2572-133 and 2458-247

# NOTICE OF ENVIRONMENTAL SITE REVIEW

(April 17, 2023)

The Federal Energy Regulatory Commission and Great Lakes Hydro America, LLC will conduct, in conjunction with the Initial Study Report meeting(s), an environmental site review of the Ripogenus and Penobscot Mills Projects. The projects are located on the West Branch of the Penobscot River and Millinocket Stream, in Piscataquis and Penobscot Counties, Maine. The site review will focus on Ripogenus Dam and McKay Station, Millinocket Lake Pump Station, and Stone Dam, as well as the West Branch Penobscot River in those areas. As time permits, other areas that may toured include the Holbrook Side Channel; boat launches, including the Ambajejus Boat Launch; transmission line corridors; Millinocket Gate House; and Millinocket battery bank.

Date and Time: Friday, May 5, 2023; 8:00 a.m. – about 12:00 p.m. (EST)

Location: Meet at the Millinocket Office, 1024 Central St., Millinocket, Maine 04462

The site review is open to the public and resource agencies. All participants interested in attending the site review should provide their own transportation.

Questions about the site review should be directed to Allan Creamer at (202) 502-8365, or allan.creamer@ferc.gov. If you plan to attend, please notify Randy Dorman at (207) 775-5605, or randy.dorman@brookfieldrenewable.com, as well as Allan Creamer, no later than April 28, 2023.

Kimberly D. Bose,
Secretary.

**Brookfield**
Renewable U.S.

April 24, 2023

***Via eFiling***

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Initial Study Report**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), the Licensee of the Ripogenus Hydroelectric Project (No. 2572) and the Penobscot Mills Hydroelectric Project (No. 2458) (collectively referred to as the "Projects"), herein files with the Federal Energy Regulatory Commission (FERC) the Initial Study Report (ISR) for the relicensing of the Projects. The Projects are located on the West Branch Penobscot River and Millinocket Stream in Piscataquis and Penobscot counties, Maine.

On June 11, 2021, GLHA filed the Notices of Intent and a Pre-Application Document (PAD), which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through FERC's Integrated Licensing Process (ILP). On March 23, 2022, GLHA filed the Revised Study Plan (RSP) and on May 13, 2022, FERC issued the Study Plan Determination (SPD).

Pursuant to the RSP, and as approved and modified by FERC's SPD, GLHA performed study activities in 2022 and early 2023. Pursuant to 18 CFR §5.15(c), GLHA herein files the ISR describing the overall progress in implementing the study plan, presenting the available study results, and describing variances from the approved plan.

FERC's regulations required that GLHA hold a meeting with relicensing participants within 15 days of the due date for the ISR filing (i.e., by May 7, 2023). Given the number of studies to be presented during the ISR Meeting, the meeting will be held over three days, on May 2, 3, and 4, 2023. The meeting will start each day at 9:00 AM and is anticipated to end each day at 5:00 PM. The meeting will be held ***in-person*** at the **Northern Timber Cruisers, Millinocket Snowmobile Club, located at 10 Northern Cruise Trail in Millinocket, Maine 04462**.

In order to plan accordingly, GLHA respectfully requests agencies or stakeholders who plan on attending the meeting RSVP by contacting Cate Russell at Cate.Russell@hdrinc.com or (207) 239-3792 on or before April 28, 2023.

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

The agenda for the ISR Meeting is included within the ISR and is provided below.

| Date/Time | ISR Meeting Agenda |
|---|---|
| **Tuesday, May 2, 2023** | |
| Morning (9:00 – 12:00) | Welcome, Safety, Ground Rules, Introductions, Relicensing Schedule |
| | Project Overview |
| | Historic Operations Data Assessment Study |
| | Operations Model Study |
| 12:00 – 1:00 | Lunch break (on your own) |
| Afternoon (1:00 – 5:00) | Water Quality Study |
| | Fish Assemblage Study |
| | Fish Stranding Study |
| **Wednesday, May 3, 2023** | |
| Morning (9:00 – 12:00) | Welcome, Safety, Ground Rules, Introductions, Relicensing Schedule |
| | Project Overview |
| | Instream Flow and Habitat Assessment below Stone Dam |
| | North Twin Tributary Access Assessment Study |
| | Upstream Eel Passage Study |
| 12:00 – 1:00 | Lunch break (on your own) |
| Afternoon (1:00 – 5:00) | Downstream Eel Passage Study |
| | Terrestrial, Botanical, and Wildlife Assessment Study |
| | Riparian and Littoral Habitat Assessment Study |
| | Loon Management Plan Assessment Study |
| | Marsh Bird Study |
| | Wood Turtle Study |
| | Furbearer Study |
| **Thursday, May 4, 2023** | |
| Morning (9:00 – 11:30) | Welcome, Safety, Ground Rules, Introductions, Relicensing Schedule |
| | Project Overview |
| | Recreation Study |
| | Whitewater Boating Study |
| 11:30 – 12:30 | Lunch break (on your own) |
| Afternoon (12:30 – 3:00) | Aesthetic Study |
| | Historic Architecture Study |
| | Environmental Justice Study |

On April 17, 2023, FERC issued notice of an environmental site review of the Ripogenus and Penobscot Mills Projects, to be conducted on Friday, May 5, 2023 from 8:00 a.m. to approximately 12:00 p.m. The site review will focus on Ripogenus Dam and McKay Station, Millinocket Lake Pump Station, and Stone Dam, as well as the West Branch Penobscot River in those areas. As time permits, other areas that may be toured include the Holbrook Side Channel; boat launches, including the Ambajejus Boat Launch; transmission line corridors; Millinocket Gate House; and Millinocket battery bank.

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

The site review is open to the public and resource agencies. Interested parties should notify Randall Dorman via the contact information below. All participants should provide their own transportation and meet at 8:00 am at the Brookfield Renewable Millinocket Office located at 1024 Central St., Millinocket, Maine 04462.

Concurrent with this filing, GLHA is providing a copy of this letter to all parties listed in the attached distribution list. Parties can download an electric copy of the public portions of the ISR from FERC's eLibrary system at https://www.ferc.gov/ferc-online/elibrary by conducting a search using the docket numbers P-2458 and/or P-2572.

Considering that the ISR provides a detailed description of the overall progress of the required studies, a separate Study Progress Report will not be filed on May 1, 2023, as the information would be duplicative of this filing. Pursuant to the ILP schedule, GLHA will file the next Study Progress Report with FERC on or about August 1, 2023.

If you have any questions regarding this letter, the ISR, or the ISR Meeting, please contact me by phone at (207) 775-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman, Licensing Manager
Brookfield Renewable

cc: Relicensing Distribution List

Enclosed: Initial Study Report

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

**Federal Agencies**

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Stephanie Carman
Acting District Manager
Northeastern States
Bureau of Land Management
626 E. Wisconsin Avenue, Suite 200
Milwaukee, WI 53202-4617

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Kimberly Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Karen McGuire
New England Region 1
Deputy Regional Administrator
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

**State Agencies**

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Kyle Olcott
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County
Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Peter Jamieson
Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
40 Western Avenue
E.S. Muskie Federal Building, Room 412
Augusta, ME 04330

Stacey Guerin
State Senator
3 State House Station
Augusta, ME 04333

Kathy Irene Javner
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, Maine 04333

Trey Stewart
State Senator
3 State House Station
Augusta, ME 04333

James Lee White
State Represenative
House Minority Office
Room 332, State House
2 State House Station
Augusta, ME 04333-0002

**Native American Tribes**

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Rena Newell
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

**Additional Parties**

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Emily Crowley
Curtis Thaxter
PO Box 7320
Portland, ME 04112-7320

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Kelly Maloney
Manager
Great Lakes Hydro America LLC
150 Main Street
Lewiston, ME 04240

Jesika Lucarelli
Great Mountain Guide Service
greatmountaings@gmail.com

John Dicentes
President
International Association of Machinists
64 Congress Street
Millinocket, ME 04462-1312

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

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Yarmouth, ME 04096

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President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
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MXH Marketing
mary@mxhmarketing.com

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Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
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Maine Brook Trout Project Director
Trout Unlimited
267 Scribner Hill Road
Manchester, ME 04351

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,

Jeff Fayle
jfayle@gmail.com

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti
granby@cox.net

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris
nsharris@mgh.harvard.edu

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Charles Paone
cpaonejr@gmail.com

Richard Parkes
Rparkesbb3@yahoo.com

Robert Van Deventer
bobvnert@gmail.com

Edward Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Wes Zemrak
2 Brookside Drive
Falmouth, ME 04105

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Brookfield
Renewable U.S.

May 22, 2023

***Via eFiling***

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Initial Study Report Meeting Summary**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), the Licensee of the Ripogenus Hydroelectric Project (No. 2572) and the Penobscot Mills Hydroelectric Project (No. 2458) (collectively referred to as the "Projects"), herein files with the Federal Energy Regulatory Commission (FERC) the Initial Study Report (ISR) Meeting Summary for the relicensing of the Projects. The Projects are located on the West Branch Penobscot River and Millinocket Stream in Piscataquis and Penobscot counties, Maine.

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Pursuant to the RSP, and as modified and approved by FERC's SPD, GLHA performed study activities in 2022 and early 2023. Pursuant to 18 CFR §5.15(c), on April 22, 2023, GLHA filed the ISR describing the overall progress in implementing the study plan, presenting the available study results, and describing variances from the approved plan. Subsequent to filing of the ISR, GLHA held the ISR Meeting with FERC staff and other relicensing participants on May 2, 3, and 4, 2023 in Millinocket, Maine. Pursuant to 18 CFR §5.15(c)(3) and the schedule provided in FERC's Scoping Document 2, GLHA is filing the enclosed ISR Meeting Summary.

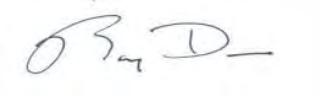
GLHA is also filing hourly operations data from 2000 through 2022 in MS Excel format for each development of the Projects.

Concurrent with this filing, GLHA is providing a copy of this letter to all parties listed in the attached distribution list. Parties can download an electric copy of the public portions of the ISR Meeting Summary from FERC's eLibrary system at https://www.ferc.gov/ferc-online/elibrary by conducting a search using the docket numbers P-2458 and/or P-2572.

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

If you have any questions regarding this letter or the ISR Meeting Summary please contact me by phone at (207) 775-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman, Licensing Manager
Brookfield Renewable

cc: Relicensing Distribution List

Enclosed: Initial Study Report Meeting Summary

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

**Federal Agencies**

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Stephanie Carman
Acting District Manager
Northeastern States
Bureau of Land Management
626 E. Wisconsin Avenue, Suite 200
Milwaukee, WI 53202-4617

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Kimberly Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Karen McGuire
New England Region 1
Deputy Regional Administrator
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

**State Agencies**

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Kyle Olcott
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Peter Jamieson
Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
40 Western Avenue
E.S. Muskie Federal Building, Room 412
Augusta, ME 04330

Stacey Guerin
State Senator
3 State House Station
Augusta, ME 04333

Kathy Irene Javner
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, Maine 04333

Trey Stewart
State Senator
3 State House Station
Augusta, ME 04333

James Lee White
State Represenative
House Minority Office
Room 332, State House
2 State House Station
Augusta, ME 04333-0002

**Native American Tribes**

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Rena Newell
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

**Additional Parties**

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground
ssindo@chewonki.org

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund
sperry@maine.com

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Kelly Maloney
Manager
Great Lakes Hydro America LLC
150 Main Street
Lewiston, ME 04240

Jesika Lucarelli
Great Mountain Guide Service
greatmountaings@gmail.com

Mark Nadeau
International Association of Machinists
245 Pamola Park
Millinocket, ME 04462

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Director
Maine Professional River Outfitters
PO Box 669
Millinocket, ME 04462-0669

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing
mary@mxhmarketing.com

Matt Polstein
New England Outdoor Center
matt.polstein@gmail.com

Michael Smith
Outdoor Sport Institute
176 Highland Ave
Millinocket, ME 04462

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Allison Economy
Representative for Allagash Gateway Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Thomas Nannery
Sportsman's Alliance of Maine
205 Church Hill Rd
Augusta, ME 04330-9801

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Jeffrey Reardon
Maine Brook Trout Project Director
Trout Unlimited
267 Scribner Hill Road
Manchester, ME 04351

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,
sharon.klein@maine.edu

Dean Beaupain
dean@bloomerrussell.com

Jeff Fayle
jfayle@gmail.com

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti
granby@cox.net

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris
nsharris@mgh.harvard.edu

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Christopher Howe
funpow89@yahoo.com

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

May 23, 2023

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**RE: Request for Extension of Time to Comment on Great Lakes Hydro America, LLC (GLHA) Initial Study Report for the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458)**

Dear Secretary Bose:

On April 24, 2023, Great Lakes Hydro America, LLC (GLHA) filed the Initial Study Report (ISR) for the Ripogenus (P-2572) and Penobscot Mills Projects (P-2458) located on the West Branch of the Penobscot River in Maine. However, the Licensee did not file electronic hourly flow data for each project as part of the ISR despite repeated requests by FERC and multiple stakeholders since the relicensing commenced in 2021. On October 8, 2021, your staff specifically requested GLHA to submit hourly operations data for the Ripogenus and Penobscot Mills Projects as part of an Additional Information Request for the projects as below. GLHA ignored this request as well.

> FERC October 8, 2021 AIR Schedule A
>
> Detailed operations data is needed to clarify how the projects are operated on a daily basis. Therefore, please include, as an appendix to the Proposed Study Plan, 10 years of operations data (in excel format) for each project, or each individual development, in the case of the Penobscot Mills Project, including: (1) daily impoundment elevations; and (2) daily outflows (minimum, maximum, and average discharges). The data for each project/development should be presented in separate tabs of the excel spreadsheet.

On May 22, 2023, GLHA filed the electronic hourly flow data with the Commission. By purposely delaying the submission of this data from April 24, 2023 (or more accurately, from October 8, 2021) to May 22, 2023, GLHA has significantly curtailed our ability to review and analyze this data which is fundamental for informing our comments including additional study requests. The electronic operations data submitted on May 22 for the Ripogenus and Penobscot Mills Project contains over one million lines of data. It is entirely unreasonable for GLHA to expect us to review it in thirty days. Therefore, we request that FERC issue a minimum 30-day extension of time to file comments on the ISR. The new date to file comments on the ISR would then be July 21, 2023, at the earliest.

We appreciate you consideration of this request. If you have any questions or need additional information, please contact Dan Kircheis (Dan.Kircheis@noaa.gov) or 207-866-7320.

Sincerely,



Julie Crocker
Chief, ESA Fish, Energy, and Ecosystems Branch
Protected Resources Division

cc: Service List

Kimberly D. Bose, Secretary June 2, 2023
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Dear Secretary Bose, Via Electronic filing

**Subject: Response to** Great Lakes Hydro America' s Inii al Study Report **Filing of April 22, 2023, Appendix L of the initial Study Report,** Loon Management Plan Assessment Study April 24, 20

After reviewing the above referenced common loon study, I found no reference to surveys of the West Branch of the Penobscot River (West Branch) below McKay Station. This reach is part of the Project area but apparently not part of the loon survey area. This oversight ignores critical loon habitat and the impact of peaking operation on nesting success in the West Branch.

The case in point is a pair of loons that appear to be currently nesting in Nesowadnehunk Deadwater, an occurrence I have witnessed for the last ten years. Based on loon sightings, the nest location appears to be on a grassy island a few hundred feet from the Golden Road causeway, another possibility is "Eagle Island' on the North side of the river.

While the presence of Loons in Nesowadnehunk Deadwater is common knowledge to campers and anglers, other deadwater areas offer similar habitats. Frozen Ocean and Debsconeag Deadwater are large areas with a variety of depths and flows. There are other possible areas which should be cataloged and surveyed to determine the impact of the current McKay Station peaking regime on loon nesting success. The Licensee should include the West Branch reaches below McKay Station in all future loon surveys and evaluate the impacts of up and down peaking flows on nesting success.

Thank you for the opportunity to comment

**Edward Spear**

**307 Mt Hope Ave**
**Bangor, Me 04401**
**Email: edspear1@yahoo.com**
**Phone: 207-217-4288**

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

June 2, 2023

Via Electronic filing

Dear Secretary Bose,

**Subject: Response to** Great Lakes Hydro America' s Initial Study Report **Filing of April 22, 2023, Appendix F of the initial Study Report,** Instream Flow and Habitat Assessment of West Branch Downstream of Stone Dam Study**, Penobscot Mills Project (FERC No. 2458)**

The Licensee is seeking to reduce soon to be mandated flows into the historic West Branch Channel below Stone Diversion Dam. In doing so the Licensee essentially duplicated a Great Northern Paper (GNP) 1989 study (conducted by Normandeau Associates Inc.) while developing "new" adult brook trout (trout) Habitat Suitability Rating Criteria (HSC) more favorable to their low flow goal. The Instream Flow and Habitat Assessment of West Branch Downstream of Stone Dam Study is based on unrealistic goals and stretches to the extreme Brook Trout biology and angler behavior. Appendix F uses subjective trout HSC, and fails to include informative reports from GNP creel surveys (circa 1997/98) of contiguous Millinocket Stream, a prime indicator stream. The report also fails to discuss fishing opportunities and cites spill and flow events without including detailed archival flow data in useable format. Absent corrected and peer reviewed adult trout HSC depth requirements, the Appendix F study report fails to provide any new and useful information to the agencies, stakeholders or FERC staff.

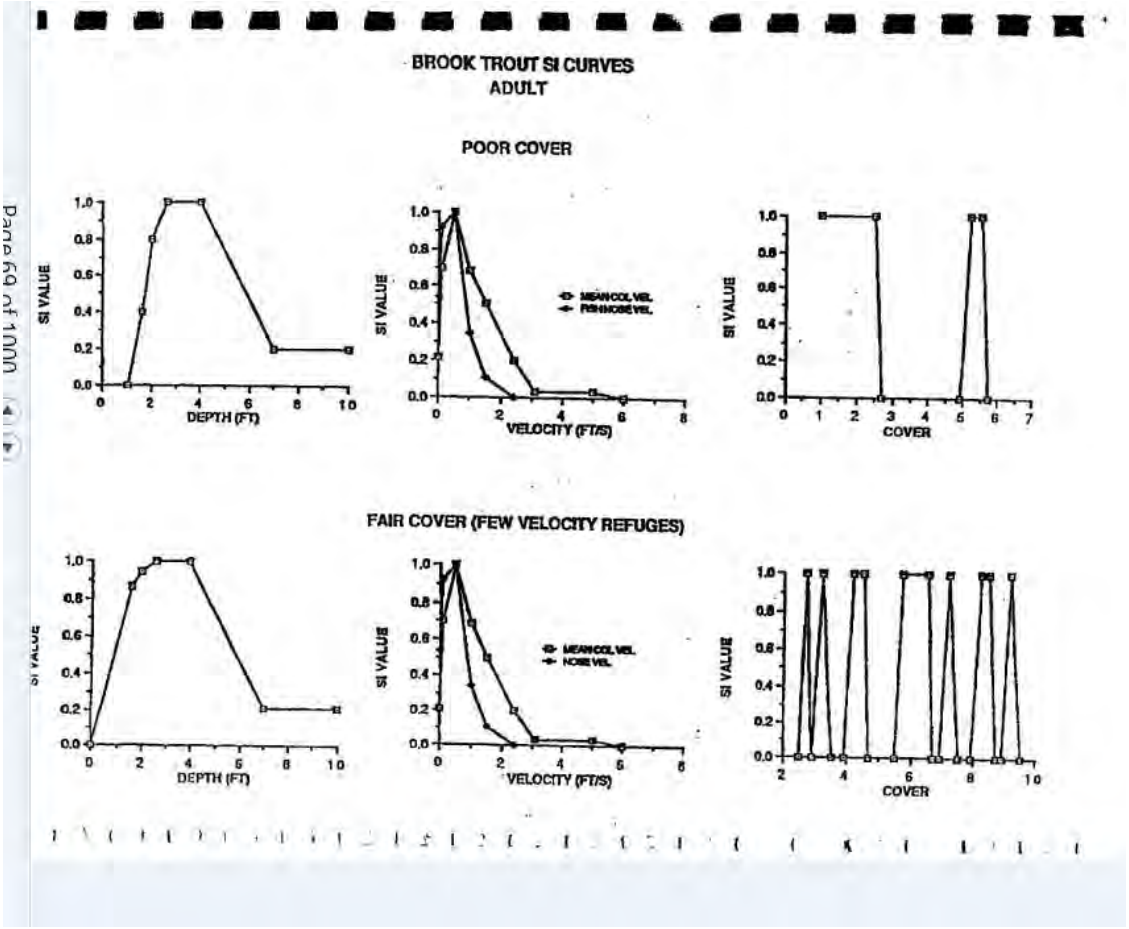
Adult trout habitat:

Adult brook trout are often found in one foot of water in mountain streams, small meadows and forested brooks. In 25 years of electrofishing sampling of the West Branch of the Penobscot River (WB) drainage, I never found adult trout in shallow water with open areas. During study years (1978-2020), we had the occasion to electrofish Caucomgomoc and Nesowadnehunk streams, the North and South Branches of the Penobscot River, and finally the WB. While adult trout were collecting in varying quantities, these habitat were always deeper with overhead

and/or significant instream cover. The proposed habitat suitability rating curves for trout need to be revisited and empirical or peer reviewed literature needs to be provided for the decision making process

The HSC for adult brook trout used in Appendix F are unsuitable for a large, wide riverine section such as the dewatered West Branch channel below Stone Dam. I was unable to locate peer reviewed publications, interim reports or summary data sheets that suggest water depth less than two feet is suitable for adult trout in a wide (200 ft), open (no overhead cover), shallow (two feet or less in depth) river reach.

The only appropriate local, Maine developed adult habitat suitability curve I found was developed and used in the Dead River (Flagstaff Storage Project P2615). In 1994 Kleinschmidt associates, members of the Licensee's current West Branch Channel study team, used the adult trout suitability indexes shown below in the Dead River licensing event. The omission of these HSC data is a mystery as both the historic West Branch Channel and Dead River are wide reaches that lack overhead cover. The Dead River HCS would seem ideally suited for the West Branch Channel instream flow study and should have been used.




Flows into the historic West Branch channel are a critical component in the ongoing licensing process. Subjective judgement should not be used to develop adult trout HSC. Available habitats at various flows will become the base for making decisions in requiring Stone Dam flows in the historic West Branch Channel for the next 30-40 years. Dead River HSC should be inserted into the habitat-flow model.

The Practicality and availability of trout for stocking. Article 413 of the current Penobscot Mills Project ordered then Great Northern Paper to upgrade historic Millinocket stream stocking of Brook Trout.

> *Article 413. The Licensee shall implement an upgraded spring and fall brook trout stocking program to provide a seasonal fishery in Millinocket Stream. Each stocking shall consist of about 500 fish ranging in size from 1/3 to one pound and shall be distributed among five locations approved by the Maine Department of Inland Fisheries and Wildlife (DIFW).*

**Duplication of Article 413 of the Penobscot Mills Project appears to be the licensee's West Branch Channel goal. A review of MeDIFW's Historical stocking Reports during the 2010 – 2022 period suggest that easily accessible Millinocket Stream stockings were not in accordance to Article 413, a likely License violation. While the authors of Appendix F state that April is a begin date, April stockings have occurred only once (2021). Maine Department of Inland Fisheries and Wildlife stocking records dating back to 2010 provided even more damming evidence. April -June stocking of catchable trout that met Article 413 guidelines only occurred twice (2021, 2022). Fall stocking at a time when fishing interest has waned, occurred regularly. For unknown reason, there were several occasions where one to two inch fry were stocked in May (see the below example) to further violate the license article.**

**Maine Department of Fisheries and Wildlife 2016 Stocking Report**

| | | | | | |
|---|---|---|---|---|---|
| 5/10/2016 | MILLINOCKET L | T1 R8 WELS | LAKE TROUT | 400 | 8 |
| 6/2/2016 | MILLINOCKET STREAM | T1 R8 WELS | BROOK TROUT | 30226 | 2 |
| 10/6/2016 | MILLINOCKET STREAM | T1 R8 WELS | BROOK TROUT | 400 | 13 |
| 11/17/2016 | MILLINOCKET STREAM | T1 R8 WELS | BROOK TROUT | 50 | 13 |
| 5/17/2016 | MOUNTAIN VIEW YDC P | CHARLESTON | BROOK TROUT | 100 | 10 |

Fishing opportunity; . A spot, or place to fish along with the presence of fish is called "fishing opportunity". It is one thing to state that fish will be stocked (trout) but this filing fails to deal with where and how anglers will locate a place to fish. Appendix F Describes '*mesohabitats upstream of Grand Falls are dominated by riffles and runs with scattered braided channels"* and *"the lower reach is narrower, steeper and has a better-defined channel*", pool areas are noticeably absent from either the narrative or photos (Appendix F-5). Clearly, unlike nearby Millinocket Stream, West Branch channel is void of places anglers would select as a place to fish. The report needs to be corrected and include pools and deep runs associated with anglers fishing for stocked trout in such as places like nearby Millinocket stream. The Licensee's present plan follows a "field of dreams" fantasy.

Season: The duration of a stocked trout fishery: Appendix F speaks of season in terms of the duration of a stocked trout fishery. "It *is expected that these fish would be stocked in April and available for angling harvest from April until mid-summer*" (Appendix P 13). As the Licensee is fully aware, this statement is absurd. Circa 1997 and 1998, GNP conducted season long (May – September) creel surveys of Millinocket Stream. Meaningful May angler use and success lasted approximately one week. Reports of these surveys should be in the GNP's

archives and possibly in MeDIFW files. These reports need to be included in the revised report. Fish stocked in May, the typical period of put-and-take trout stocking, assuming trout would find suitable pools and deep runs to populate and anglers could find a location suitable to fish, the proposed stockings might provide a one-week fishery.

Leakage/Spillage: The Licensee suggests that flow in the Channel is greater than the 3.0 cfs stated in the EIS. "*However, the total amount of leakage occurring at Stone Dam at any given time varies depending on the seasonal impact of flows and ice on the flashboards and short-term wind/wave action. Two more recent measurements of leakage conducted in 2021 found that leakage varied between 17 and 100 cfs".* The connotation is that current flows are environmentally better than previously recorded. The Licensee is a very competent manager of storage and flow, sometimes to the determent of fish and aquatic communities. In this section, we are told that the Licensee routinely allows a 100 cfs of flow to escape energy production. I seriously doubt this.

The Licensee has provided lake elevations from North Twin and Stone Dams and hourly average flows from the North Twin and Mill One facilities that may support the claim of higher leakage. The much needed flow data presented in the Licensee's filing dated May 23, 2023 demonstrates the change in operations to a peaking mode. However, these data are totally inadequate in documenting *higher leakage (flow) claims* as the level of detail needs to be refined into shorter time periods (see Results – Flows from Stone Dam at Millinocket Development (2000-2022)). Alternately, the Licensee using more proficient programming skills, can list the volume and dates that "higher leakage flows" occurred. The burden of proof is the Licensee's. Absent these data, the Licensee should strike these "leakage flow" references from Appendix F.

Appendix F also mentions spill events that result from unseasonable large rain events. Unlike naturally produced landlocked salmon, hatchery reared stocked trout are extremely vulnerable to sudden flow change. The fact that the WB channel area lacks flow refuge i.e. pools and deadwaters, only increases the likelihood that trout would be displaced downstream. Spill events are recorded in archival GNP files. The Licensee should provide 50 years of April, May, and June spill event data.

For the reasons explained above, Appendix F provides data that demonstrates the futility of attempting to create a "put and take" trout fishery. In order to facilitate agency and stakeholder rebuttals as the process moves forward, FERC should

request that the Licensee recalculate adult trout habitat at various flows using Dead River HSC. The Licensee should also provide the requested flow and elevation data in minute detail, provide circa 1997/1998 Millinocket Stream License article 403 mandated creel survey reports, identify potential fishing sites and angler access points in the historic West Branch channel. As presented, Appendix F does not meet the study goal and provides no new useful information.

Thank you for the opportunity to comment

**Edward Spear**

**307 Mt Hope Ave**
**Bangor, Me 04401**
**Email: edspear1@yahoo.com**
**Phone: 207-217-4288**

**CC:** Ms. Alicia Burtner

FEDERAL ENERGY REGULATORY COMMISSION
Washington, DC 20426
June 6, 2023

OFFICE OF ENERGY PROJECTS

Project Nos. 2572-133 & 2458-247 –
Maine
Ripogenus Hydroelectric Project
Penobscot Mills Hydroelectric Project
Great Lakes Hydro America, LLC

**VIA FERC Service**

**Reference: Extension of Time to File Comments on the Initial Study Report**

To the Parties Addressed:

On April 24, 2023, Great Lakes Hydro America, LLC (GLHA) filed its Initial Study Report (ISR) for the Ripogenus Project (P-2572) and Penobscot Mills Project (P-2458) (collectively, the Projects). Due to the large volume of information filed with the ISR and ISR meeting summary, the ISR comment deadline is extended 15 days to **July 6, 2023**, and the Director's Study Plan Modification Determination deadline is now **September 4, 2023**.[1]

Sincerely,

VINCENT YEARICK
Digitally signed by VINCENT YEARICK
Date: 2023.06.06 07:40:44 -04'00'

Vince Yearick
Director
Division of Hydropower Licensing

[1] Pursuant to section 5.29(f)(2) of the Commission's regulations, sections 5.15(c)(4), 5.15(c)(5), and 5.15(c)(6) are waived to provide additional time to file comments on the ISR, responses to ISR comments, and the Director to issue the Study Plan Modification Determination.

Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E. Washington, DC 20426

RE: Comments on the Environmental Inspection Report submitted May 2, 2023 for the Ripogenus Hydroelectric Project (FERC No. 2572) from the Caribou and Chesuncook Lake Camp Owners Association and the Chesuncook Dam Camp Owners Association.

Dear Secretary Bose:

On behalf of the members of the Caribou and Chesuncook Lake Camp Owners Association and the Chesuncook Dam Camp Owners Association, I am submitting these comments in response to the Environmental Inspection Report for Ripogenus Project 2572 conducted on August 17, 2022 and submitted May 2, 2023.

The two Associations represent over fifty camp owners with a significant and substantial interest in the operation of this project and its effects on the lakes, and surrounding ecosystems including their fish and wildlife. We have a deep love for, and knowledge of, Caribou, Chesuncook, and Ripogenus Lakes, all natural lakes interconnected and level controlled by Ripogenus Dam. We all have large financial and time commitments to our properties. Many of our members have long multi-generational histories on the lakes and know them well before and after the current licensee.

There are discrepancies between statements in the Initial Study Report presented to stakeholders in May of 2023, and claims made by the licensee in the The Safety Inspection Report, conducted on August 17, 2022. The purpose of this letter is to identify those discrepancies.

The Inspection Report states,

"*The licensee deploys seasonal nesting platforms for loons and other waterfowl every spring. As the inspection occurred in August, representative platforms were inspected in storage. They were found to be adequately maintained and appropriately built for their purpose (photo 3).*

This claim is not substantiated in the Initial Study Report (ISR) Loon Study or by statements from the licensee at the Study Report meeting. The ISR does provide a picture of a loon platform in the water in 2022. As supported by anecdotal evidence of those who spend a considerable amount of time on the water, 2022 is the year evidence of monitoring and maintenance of platforms began again. It is also the year after the Pre Application Document was submitted. The licensee provides no explanation of why platforms were unable to be inspected in the month of August. The ISR explains, *"Due to the size and weight of the nest platforms, platforms remain in place or are towed to the shoreline and are propped up to dry for the off season."* If this is accurate, it would have been possible to inspect platforms on site in August. At the ISR meeting, when asked by Maine Inland Fisheries and Wildlife representatives if loon platforms are left high and dry as drawdowns occur, or carried to shore at the end of the season, a Brookfield

representative replied that unfortunately, yes, the platforms were left wherever they had been deployed, further supporting the ability to conduct on lake inspections in August.

The ISR does provide evidence supporting attainment of Article 409 in the past, *"At the end of the required 10 years of monitoring (2000-2010), GLHA was required to assess whether additional monitoring was required in consultation with the USFWS, MDEP and MDIFW. The MDEP responded that it had no comments on the report and no comments were received from the USFWS or MDIFW. GLHA recommended no additional monitoring or reporting at the Ripogenus Impoundment based on the findings of the 10 years of monitoring data. However, GLHA proposed to continue to deploy artificial nest platforms and increase the number of nests deployed in the Ripogenus impoundment and proposed to periodically check platforms to ensure they were functioning properly. Pursuant to an order issued February 9, 2011, FERC determined that the final report fulfilled the requirement of Article 409 and determined that monitoring was no longer required.*

However, attainment of Article 409 does not equate to the licensee's claims of "deploying seasonal platforms every spring," while providing a picture of a new platform in a storage facility as evidence. In the ISR, the licensee submits, *"Although nest monitoring use/success was discontinued in 2011, GLHA continues to check the nests at least once during the nesting season to evaluate the condition of the platform and make repairs if necessary.* ***Although not documented by GLHA staff since 2010****, GLHA staff responsible for deployment and maintenance have observed use of some of the platforms by nesting loons."* This claim, with no supporting evidence, is very different from the experience of lake users who have observed loon platforms, which have stayed in place for years, unmaintained, never even touching water in low water years.

The Loon Study data from 2000-2010 is dismal. In the 10-year span, eight of the eleven platforms were never utilized by loons. Of the platforms utilized, between 2000 and 2010, seven eggs hatched, two eggs were abandoned, three eggs were gone from nests and one egg was dead. This data does not constitute a successful program. It is unfortunate continued platform deployment and maintenance were not continued regularly, but the licensee was not required to do so. The licensee should be accurate in their portrayal of the lack of loon program from 2010-2021. It is disheartening to see such little effort from the licensee to protect one of Maine's most iconic species.

There is further discrepancy between the Inspection Report and the ISR regarding hydrology and flows. In the Inspection Report, Commission staff cites "*a member of the public alleged that the prior weekend a whitewater release did not occur*. *Licensee flow data was provided to verify adequate flows pursuant to Article 402 occurred*." Flow data provided to stakeholders by the licensee (see below) shows combined station and non-station flows on Sunday, August 14, 2022 ranging from 1540 cfs to 1877 cfs between the hours of 0830-1700. The required rafting flows for that day/time are 2200-2300 cfs depending on the hydrology of the year.

| Date/Time | Flows (cfs) | Non Station Flow | Lake Level |
|---|---|---|---|
| 2022-08-14 08:00:00 | 1440 | 100 | 935.03 |
| 2022-08-14 09:00:00 | 1482 | 100 | 935.04 |
| 2022-08-14 10:00:00 | 1524 | 100 | 935.02 |
| 2022-08-14 11:00:00 | 1566 | 100 | 935.02 |
| 2022-08-14 12:00:00 | 1609 | 100 | 935 |
| 2022-08-14 13:00:00 | 1651 | 100 | 934.99 |
| 2022-08-14 14:00:00 | 1693 | 100 | 934.98 |
| 2022-08-14 15:00:00 | 1735 | 100 | 934.97 |
| 2022-08-14 16:00:00 | 1777 | 100 | 934.96 |

As explained in the Inspection Report, drought is also cited by the licensee as another reason for low flow, *"Due to persistent drought conditions in the area, prior whitewater flows had been more apparent in 2022, because the licensee had to significantly increase flows to meet the requirement."* This statement is in direct conflict with the ISR (see below) which identifies 2022 as a wet-average year. Those using the lakes and rivers were thrilled in 2022 there was finally water after 2021 being exceptionally dry.

| | | | |
|---|---|---|---|
| 2010 | 2,669 | 11 | Average |
| 2014 | 2,690 | 10 | Average |
| 2022 | 2,741 | 9 | Wet-Average |
| 2007 | 2,956 | 8 | Wet-Average |
| 2009 | 2,981 | 7 | Wet-Average |

The Safety Inspection was conducted nearly nine months before the ISR and flow data were released, both containing information that contradicts the Inspection Report. We want to ensure discrepancies are documented so licensing decisions can be made with accurate information.

Thank you for the opportunity to provide comments.

Respectfully,

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association
Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947
bhoustonps@gmail.com

Kimberly D. Bose, Secretary June 26, 2023
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426 Reforma! ed June 30, 2023

Dear Secretary Bose, Via Electronic filing

**Subject: Response to** Great Lakes Hydro America' s **Filing of April 24, 2023, Appendix D of the initial Study Report,** Fish Assemblage Study Report.

The Fish Assemblage Study was conducted at the request of Maine Department of Environmental Protec#on (MDEP) and Trout Unlimited (TU). The study plan, as implemented, is a product of the Licensee. Field collec#ons were imitated in July, 2022.

This filing as with all others of the Licensee, is part of an on-going strategy to whitewash the change in Project opera#on from papermaking produc#on with steady flows and gradual drawdowns to market driven peaking power with highly variable flows and dras#c drawdowns. The Licensee contorts itself to paper over the drama#c impact of this radical shi%on fish and aqua#c communi#es. The Fish Assemblage Ini#al Study Report (ISR) a! empts to create a "record" for future legal arguments rather than provide robust field collec#on results that describe the status of the Ripogenus Project's salmonid and smelt popula#ons(s). The ISR does not accomplish agency and stakeholder goals. The ISR also contains a number of errors and conclusions based on faulty assump#ons. Major omissions are the result of a flawed study design. This filing is intended to correct the record.

<u>The Reasons for Studies</u>

There are both technical and anecdotal reports that indicate the Ripogenus Impoundment and the downstream West Branch of the

Penobscot River (West Branch) are no longer mee#ng fisheries goals. The Maine Department of Inland Fisheries and Wildlife (MeDIFW) creel survey reports demonstrate a decline in the Ripogenus Impoundment salmon growth and low abundance of historical “common” large (>18”) landlocked salmon (salmon). Anecdotal reports indicate that the fish and aqua#c insect communi#es of the West Branch downstream of McKay Sta#on have precipitously declined. Fisheries and aqua#c community informa#on collected in the Big A Applica#on (P2669) and then Ripogenus Project Applica#on process is 35-45 years old and out dated. Especially so because Project opera#ons are now widely fluctua#ng peaking flows and rapid impoundment drawdowns. There is no current quan#ta#ve informa#on on the size of the Ripogenus salmon popula#on e.g. mark recapture es#mates and NO informa#on on the West Branch salmon popula#on downstream of McKay Sta#on rela#ng to abundance, age and growth, spawning and movement in response to peaking flows. Juvenile smelt raised in the Ripogenus Impoundment support both lacustrine and riverine salmonid popula#ons. The abundance and age structure of Ripogenus smelt popula#on(s) is unknown as is the reason(s) for their paucity.

There is no current informa#on on angler use and catch in the riverine areas below North Twin and Dolby Dams or the Millinocket facility. Historically (GNP 1991) these reaches supported salmon fisheries of varying magnitudes. Moreover, access to Millinocket and Dolby facili#es is limited by imposing fencing. To date, no a! empt has been made to define the status or poten#al of these fisheries.

Study Requests and Par#cipants

The MeDEP and TU requested fish assemblage studies. The former to determine if water quality standards were being met; the later for comparison to historical fisheries data (see 1991 Applica#on). These studies were approved and carried out in 2022. The ISR Appendix D was

issued April 22, 2023. Unfortunately, in numerous cases, cri#cal data were misrepresented or in many cases, not collected due to faulty study design or limita#on of sampling gear.

The ISP was caried out by three consul#ng firms: Kleinschmidt Associates, Normandeau Associates and Midwest Biodiversity Institute MBI. Having electrofished and trap ne! ed all the impoundments and riverine reaches surveyed, clearly a great deal of #me and effort was expended. This was an impressive effort with unimpressive results. Collec#vely these survey groups will be referred to as the Licensee. Authorship of the ISR Appendix D is unclear.

General comments

Throughout the study phase of these ongoing licensing processes the Licensee has chosen sampling sites and methods contrary to standard or suggested protocols. The fish assemblage study is no different. With the excep#on of fall sampling near Umbazookus Stream, the Licensee sampled when it wanted and where it wanted. The sampling scheme carefully avoided the “smelt issue” and the abundance, growth and spawning success of West Branch salmon. There were no comparisons between GNP 1991 data and the results of fish assemblage sampling. Many data gaps or voids remain unanswered.

The ISP contains glaring unexplained absences.

- Scale samples were not removed from salmonid species despite a US Fish and Wildlife Service (FWS) request, a normal component of salmonid sampling.
- In the comment period, FERC required Spring sampling and the FWS recommended GLHA add Spring 2023 sampling events (smelt, white and yellow perch and longnose suckers are spring spawners)

- The ISP provides great detail of fish handling protocols, however there is NO men#on as to how the fish were anesthe#zed or how they were held during recovery. It is physically impossible to handle salmonids e.g. weigh, examine for wounds (damaged vertebrates) without quie#ng the fish.
- A! emp#ng to sample pelagic fish e.g., salmon and smelt with shallow water sampling gear e.g., trap nets and boat electrofishing predetermined the lack of meaningful results. Major issues remain unanswered.
- While requested, smelt abundance either by riverine dri%ne' ng or by a variety of lacustrine methods e.g., trawls, ver#cal gill nets, etc. was not undertaken.
- While presented in graphic form for other species, salmon and smelt length distribu#ons were not provided.

The proposed Fish assemblage study included a desktop-based effort to compile, review, and describe exis#ng, contemporary data and anecdotal informa#on collected in the Ripogenus impoundment by the MeDIFW and other organiza#ons. In their April 7, 2022, comments on the RSP, the MDEP reiterated their request for a field-based fish assemblage study for the Ripogenus impoundment. The US Fish and Wildlife Service (FWS) *"recommends GLHA add smelt spawning surveys to all major tributaries to Chesuncook Lake, Caribou Lake, and Ripogenus Lake.*
*FWS recommends GLHA collect scales from all trout, salmon, whitefish, smelt, and togue for age and growth analysis as well as stomach contents for all game species.*

*FWS recommends GLHA compute, and include in the Initial Study Report, the proportional stock densities for all game species.*

- *FWS recommends GLHA conduct Atlantic salmon redd surveys in various reaches of the West Branch, downstream of McKay Station, including in the Little A, and Nesowadnehunk Deadwaters.*
- *Smelt drift nets should be installed weekly from April to November in the West Branch in the Holbrook reach on both sides of the river."*

Juvenile smelt (less than a year old) provide critical salmon forage in the impoundment and West Branch of the Penobscot River (West Branch). Salmon are the fish species that MeDIFW focus its management goals. The lack of information on the spawning success, age structure and abundance of the Ripogenus smelt population is critical in the future decision making process and is a major data gap.

Informa#on gathered in the Office Study

The “office study” included examining exis#ng data available in MeDIFW files and the former Licensee, Great Northern Paper’s (GNP) 1991 License Applica#on. GNP data were based on field collec#on da#ng from 1978 – 1989. Despite the Licensee’s claim that a “vast body” of (1978-1989) informa#on exists, very li! le of material found in the 1991 License Applica#on was included in ISR. The Licensee “cherry picked” MeDIFW informa#on, providing only data that supported the goal of “nothing has changed”, all is well. Informa#on presented as being MeDIFW’s, in several instances was GNP data, and to make ma! ers worse, was incomplete or unsupported with exis#ng tabular data.

From the office study the Licensee states that MeDIFW has a “good understanding” (Appendix D-40) of the Ripogenus Impoundment fish community. “Good understanding” is a term of art, a management posi#on rather than a scien#fic finding. If the Licensee found the necessary MeDIFW reports concerning trap ne' ng, seining, ver#cal gill ne' ng, hydroacous#c, telemetry or even the use of minnow traps, these data should be provided. Absent these data, the stakeholders, agencies and FERC staff will s#ll lack knowledge needed to fill data gaps and argue for the necessary protec#on of fish and aqua#c communi#es. Further studies are required to fill these cri#cal data gaps.

The Licensee adds that MeDIFW stated “no exo#c fish species are known to exist” (P 41). The meaning of this statement is unclear. Is exo#c used as a synonym for non-na#ve/non indigenous fish? The

Licensee has o%en been confused about indigenous and non indigenous fish species. For the record, yellow and white perch and smelt are not indigenous species. Salmon salar, the marine species was indigenous, the landlocked version were introduced circa 1890. The Licensee needs to clarify any differences between exo#c, non indigenous and well established or present species.

The Licensee also quotes MeDIFW's characteriza#on of non salmonid, exo#c species such as white and yellow perch as being abundant. "Abundant" is subjec#ve and useful as a fisheries management tool, but when quan#fying a fish community, "abundant" compared to what? What is the density in terms of fish or pounds per acre of white and yellow perch or smelt popula#ons? While shoreline boat electrofishing and trap ne' ng provided some useful informa#on, these are "shallow" water methods and thus biased and do not describe or quan#fy the impoundment's fish community. Moreover, yellow and white perch are species neither manage nor desired for by MeDIFW in Project waters.

The Licensee con#nues with the search of archival files, producing WB smelt data found in MeDIFW files, ci#ng it as MeDIFW work. This appears to be incorrect as 1999-2001 data (table 6) were collected by GNP. The misrepresenta#on con#nues. A casual reading would suggest that smelt were available in 2021 in the same abundance as in the 1980-1989 GNP sampling period. This is incorrect. A%er a ten plus year pause, GNP resumed smelt collec#on in 1999. All GNP smelt dri% net sampling ended in 2001. The GNP sampling protocol was that smelt dri% nets were set weekly for approximately 24 hours and "metered" (velocity/depth/width and #me fished). Annual es#mates of smelt biomass were made, in pounds rather than number. Typically, depending on month, there were between 450 (winter) to 1350 smelt (August) per pound. The MeDIFW samplings were based on #me available. Limited collec#on simply proves a few smelt were available during a certain period. The MeDIFW informa#on shown lacks lengths and weights from

individual fish. Whether the smelt were juvenile or older is unknown. Thus, any comparisons between the archival GNP smelt data and MeDIFW data are impossible. Any sugges#on as to the abundance of smelt (dri%), the key salmon forage item, in the West Branch remains largely unknown and is the most significant of the many data gaps, voids or black holes.

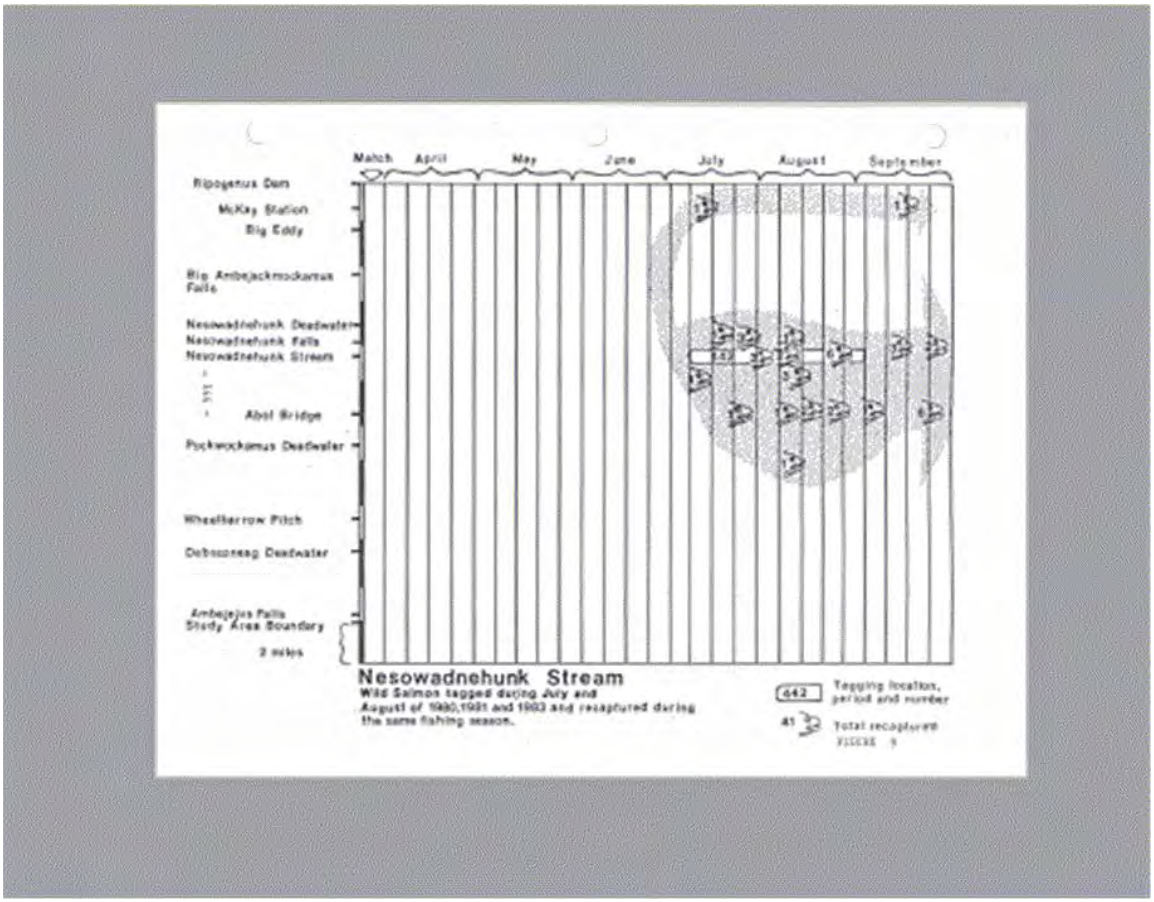
Results of Field Collec#ons

The Licensee undertook the fish assemblage study of the Ripogenus Impoundment in July and the electrofishing of West Branch of the Penobscot River below McKay Sta#on in August and September of 2022. No reason is given for the August electrofishing event when water temperatures were 22 C, and stressful for handling adult salmonids. While the results of these extensive efforts provide some useful insight of current fish popula#on, significant data gaps remain. Study results of the Ripogenus Impoundment demonstrate that the Lake Whitefish popula#on is either ex#nct or near ex#nc#on. While length data were not provided, the rela#vely large mean length of Ripogenus Impoundment smelt (Table 26) demonstrates the popula#ons are top-heavy with age II or older fish and out-of-balance and landlocked salmon growth is severely limited by the apparent lack of yearling smelt.

The August and September of 2022 electrofishing surveys of the WB failed to provide a comprehensive data set. For unknown reasons, scale samples were not taken from salmonids, thus no lengths at age are known. MeDIFW management objec#ves are commonly based on age classes and annual growth. Comparison between assemblage survey fish and salmon and trout collected during the 1978 – 1988 surveys which were filed as part of the 1991 license applica#on cannot be made.

The ini#al study plan appeared to call for electrofishing the river immediately below Nesowadnehunk Falls. For unknown reasons the

study area was expanded to include the area immediately below Nesowadenhunk Stream. This corrupted the results. The West Branch below Nesowadenhunk Stream along with the reach immediately above Abol Bridge are the major spawning staging loca#ons for North Twin Impoundment salmon (see below Vol IX Figure 9, 1991 Ripogenus License Applica#on). The photo shown in Appendix D- 81 shows two healthy salmon and one salmon in a degraded state. Is this a comparison of North Twin Impoundment salmon and West Branch salmon? It is likely that samples collected at Nesowadenhunk stream included and were perhaps dominated by North Twin Impoundment salmon.




Lake Whitefish

The Licensee failed to collect Lake Whitefish (Whitefish) despite extensive trap ne' ng efforts that included the area near Umbazookas Stream as it enters the Ripogenus impoundment. Numbers of Whitefish were collected at the same site during GNP's 1990 fall trap net survey. Although the Licensee's ISR states Whitefish had not been collected by MeDIFW since 1970, whitefish appeared in MeDIFW's 1996-2021 angler surveys (D-42) as well as GNP 1988-1990 winter angler surveys. Yoder 2005 lists Whitefish as being present (Table 4, Appendix D 40).

The Licensee appears to concede the Whitefish issue by providing an unsolicited excuse for the apparent Whitefish ex#nc#on. They claim Whitefish are declining statewide and the ex#nc#on of the Ripogenus popula#on is to be expected. The Licensee cites introduc#on of smelt and inter species compe##on as a cause. This is incorrect and, as is o%en the case, ignores facts.

Nearby Whitefish popula#ons are within walking distance of the Ripogenus Impoundment via the old Umbazookas and Eagle (and Chamberlin) Lake railroad right-of-way, presently a portage route. Addi#onally, and downstream of the Ripogenus Impoundment, MeDIFW reported Whitefish as recently as the 2022 winter creel survey of Pemadumcook lake (Table 51). These nearby Lakes are technically impoundments and share the commonality of having very limited, late summer drawdowns and smelt popula#ons that have existed for a hundred years. There is a clear nexus between the demise of whitefish in the Ripogenus Impoundment and the recent change in Project opera#ons to a market driven, earlier, and more dras#c drawdown regimes.

<u>Landlocked Salmon</u>

The Licensee's study of the West Branch below Mckay Sta#on provided virtually no informa#on on the abundance, distribu#on, growth,

movement and spawning success of sub adults and older salmon. Study design and equipment simply did not allow for sampling adult fish in deep water areas. The rela#vely few yearling and older fish, NOT COLLECTED from the Nesowadnehunk Stream pre-spawning staging area, demonstrated a popula#on with poor condi#on factors. The FWS requested, redd surveys were not undertaken. Thus, there is no informa#on on spawning and the subsequent impact of peaking flows on spawning and incuba#on success. Addi#onally, food habit informa#on was not collected and possible shi‰s in diet from one aqua#c invertebrate to another were not provided.

The Licensee apparently did not sample the West Branch below North Twin Dam in 2022. Considering the historic significance of this fishery, the omission is very strange. Instead, the Licensee repeats the "office study" and republished data collect by EBI in 2005 but fails to include 1991 data (GNP 1991). As deep water areas are precluded by sampling limita#ons, 2005 data collected by boat electrofishing are biased. This reach supported a significant landlocked salmon fishery in the 1980s and anecdotal informa#on was that this area supported a good salmon fishery in May, 2023. No effort is made to describe salmon popula#ons below Mill One or Dolby Dam despite historic abundance.

The Licensee has weaponize temperature and dissolved oxygen results and uses these data to dismiss "so called" marginal waters presently suppor#ng salmon produc#on. Salmon can find short term thermal refuge in the metalimnion or in riverine spring seepages. Fish, salmon in this case, are the proof of whether "marginal waters" can support salmon, not a computer spread sheet.

Rainbow Smelt

Despite a FWS request, there was no directed sample of smelt in either the Ripogenus or North Twin Impoundments or associated riverine

reaches. Juvenile smelt, less than a year old, are a cri#cal, perhaps the only significant prey item of adult salmon. Shi‰s in smelt abundance have been linked to the loss or shi%of li! oral zones, drawdowns and lake level fluca#on. Therefore, it is not surprising that the Licensee has avoided all efforts for any directed sampling of lacustrine or riverine smelt sampling.

From MeDIFW sampling of the Ripogenus Impoundment and an#dotal reports of the West Branch downstream of McKay Sta#on, it is clear that smelt, or at least juvenile smelt, no longer exist in abundances needed to support the historic high quality salmon fisheries. Although the North Twin Impoundment appears to be mee#ng MeDIFW management goals, informa#on on smelt in the impoundments and riverine reach of the Penobscot Mills Project is lacking. Fisheries in riverine areas below Mill One and Dolby remain a mystery.

The Licensee's fish assemble study was not designed to sample smelt, a spring spawner fish with pelagic tendencies. There was no directed sampling of Lacustrine smelt popula#ons. Despite the FWS request, there was no smelt sampling data provided. This is no longer a data gap. It has become a black hole designed to avoid shedding light on the current peaking opera#on and associated lake level management.

Lake Trout

The ISR lists Lake Trout as non-na#ve and MeDIFW no longer manages the Ripogenus Impoundment for this species. Addi#onally, Lake Trout spawn in the fall, o‰en in shallow areas and historic opera#on beginning in the 1950s with the start-up of McKay Sta#on would have limited recruitment. However, Lake Trout were apparently na#ve to upstream Caucomgomoc Lake and other nearby lakes. Early bathymetric maps of the Ripogenus Impoundment depicted a point known as Togue Ledge. It would seem reasonable to assume the name, Togue Ledge, was

connected to the deep water area around this point of land. Presumably, a historical Lake Trout fishery of unknown magnitude existed in that part of Chesuncook Lake (Ripogenus Impoundment).

Burbot (Cusk)

Historically Burbot (*Lota lota*) provided a directed winter fishery (often by set lines, at night) in the Ripogenus Impoundment (as well as the North Twin impoundment). The Licensee collected Burbot by trap net but not by electrofishing in the summer and early fall of 2022. As with longnose suckers, Burbot inhabit the bottom in deep water areas during May through September. Once impoundment waters cools, Burbot inhabited shallower areas and were a major by-catch in sampling shown in GNP 1991. The Licensee failed to provide weight distributions for the 36 Burbot it collected (Table 21), most of the Burbot appeared to be small, juvenile fish. Based on the Licensee's sampling the Burbot in the Ripogenus Impoundment, the population appears to in a major decline. The historic Ripogenus winter Burbot fishery is in jeopardy.

## 6.0 Summary

The Licensee provides several tables and figures that a! empt to show diversity in the fish popula#on of project waters. This is not informa#on that MeDIFW manages the fisheries resource with or that MDEP uses as they judge the "as natural occurring" standard of the Water Quality Cer#fica#on process. The abundance of white sucker, white and yellow perch is largely irrelevant. This summary material, while it iden#fies several species not found in the 1991 license Applica#on, fails to demonstrate that fisheries management goals or water quality standards are being met. In fact, the reverse is true. Taken at face value, Whitefish have been (apparently) expatriated. Salmon abundance and growth have declined. The Ripogenus smelt popula#on is "out of balance". The status of the Burbot popula#on is likely in decline as well.

The Licensee touts study results and takes a number of pages to discuss Biological Condi#on Gradient (BCG). The Licensee would suggest that a reading the of BCG would show the fisheries are in good health. This is incorrect. BCG finding although interes#ng have li! le relevance to relicensing issues. MeDIFW management goals are salmon and indirectly smelt. MeDEP standards include “as naturally occurs.” Improvised salmon popula#on in the Ripogenus Impoundment and the downstream West Branch are not mee#ng that standard. Non na#ve species such as white and yellow perch are a nega#ve on any species list where salmonid management is the goal.

The ISR ignores salmonid fisheries in the riverine reaches downstream of North Twin and Dolby Dam and the Millinocket facility. While some of these areas had limited access, at a minimum there were seasonal salmon fisheries during the 1985-1989 period. Boat electrofishing results, restricted by sampling gear, are no excuse for elimina#ng these reaches as areas capable of providing fishing opportuni#es. GNP 1991 creel survey data demonstrates that if suitable access is provided, significant fisheries would develop.

*Final comments*

The Licensee’s consultants expended a tremendous amount of effort sampling Ripogenus Project waters. Poor study design produced study results that created more ques#ons than were answered by study results. The tac#cal omission of GNP 1991 data and only par#ally including MeDIFW data further reduce the value of the April 24, 2023 ISR. The lack of the requested smelt data and salmonid scale samples for age-growth informa#on cannot be overcome by verbiage. Despite glowing statements concerning species richness, the reader is le% with the sense that the Ripogenus Impoundment and downstream West

Branch are in a precipitous decline when compared to GNP 1991, when FERC Licensed a non-peaking system.

At a minimum, FERC should request the Licensee revise Appendix D by addressing the above men#oned errors and omissions. Presently Appendix D is part of the record. Le% uncorrected the errors and omission provide li! le useful informa#on to the agencies, stakeholders and FERC Staff.

Thank you for the opportunity to comment.

Edward Spear
307 Mt Hope Ave.
Bangor, Me 04401
Email: edspear1@yahoo.com
Phone: 207-217-4288

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JANET T. MILLS
GOVERNOR

STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
353 WATER STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041

JUDITH CAMUSO
COMMISSIONER

*Via Electronic Filing*

June 29, 2023

Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

**Re: MDIFW Comments on the Initial Study Report for the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458)**

Dear Secretary Bose:

On April 24, 2023, Great Lakes Hydro America, LLC (GLHA), a subsidiary of Brookfield Renewable (Brookfield, Licensee), submitted their Initial Study Report (ISR) for both the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458). The Projects are located on the West Branch of the Penobscot River and Millinocket Stream, and span both Piscataquis and Penobscot Counties, Maine. MDIFW attended the ISR Meeting on May 2-4, 2023, as well as the FERC Project Site Visit on May 5, 2023. We offer the following comments and New Study Requests below.

***Ripogenus Project Comments***

Recreation Study/Creel Surveys Discussion

There have been several questions raised by other stakeholders regarding angling information and the lack of this information in the Recreation report at the ISR meeting. While MDIFW typically requests this information as part of relicensing proceedings, we did not request clerk angler surveys from GLHA during the initial study requests. The following discussion is meant to clarify to FERC and other stakeholders MDIFW's rationale for not requesting clerk angler surveys as part of this relicensing proceeding.

MDIFW relies on several types of angler/creel surveys, depending on the situation. The primary goal of any survey is to collect catch per unit effort (CPUE) data for gamefish species that can be used to monitor trends over time. Therefore, the method of survey needs to be consistent. We cannot directly compare CPUE data gathered during a clerk survey with a voluntary box/book survey because voluntary data tends to be biased toward the more successful anglers. However, voluntary box/book data *can* be compared with other similar voluntary data over time, and to other waters where this type of survey has been conducted, although voluntary surveys do not typically include staff handling fish to evaluate age/growth or food habits.

By way of background, MDIFW remains the most underfunded fisheries agency in the United States:

Maine currently gets the minimum distribution from the federal Dingell-Johnson fund, which is the main source of funding for our Fisheries Division, yet Maine ranks 13th among States regarding the amount of aquatic habitat to manage for sportfish. This discrepancy between aquatic habitat management and federal funding ranks Maine last. Moreover, the Moosehead Lake Region, where the Ripogenus Project is located, has nearly ¼ million acres of standing water and over 4,000 miles of flowing water--more water than six entire States. If all 50 States were listed by the amount of water present for sportfish management, the Moosehead Lake Region would rank higher than New Mexico, Connecticut, Delaware, New Hampshire, Rhode Island, and West Virginia, yet the Moosehead Lake Region only has three permanent fisheries staff. By comparison, New Mexico receives over $6.6 million from Dingell-Johnson funding annually. Moreover, the Moosehead Lake Region receives a very tiny portion from the $3.9 million total allotment to the State of Maine. Therefore, we must be judicious in planning our work, and as clerk surveys are labor-intensive, requiring staff to be on-site multiple days a week over the course of the entire fishing season, we do not have the available staff or equipment to conduct clerk angler surveys to replicate similar Licensee work on the West Branch of the Penobscot River into the future. We rarely conduct clerk surveys on any of the Region's rivers because we must utilize our available staff on Moosehead Lake (Maine's largest Lake), the Ripogenus Impoundment (Maine's 2nd largest lake), Chamberlain Lake (Maine's 10th largest lake), and other important waters. We frequently utilize voluntary box surveys on our river systems, and while we recognize that not all anglers participate, those that do tend to be the more successful anglers. However, if the data are collected in the same manner over time, trends in CPUE can be developed and compared on a yearly basis, and to other waters with similar data.

MDIFW plans to periodically collect CPUE data on the West Branch of the Penobscot in the future. Therefore, we must rely on a repeatable survey method. While it would be desirable to have the sufficient staff to conduct full clerk surveys on this large, important river (and many other locations in the Region), it just is not feasible due to current staffing levels.

Included below are results from the voluntary box census on the West Branch of the Penobscot 2021 – 2022 (Ripogenus Dam to Sourdnahunk Falls):

Voluntary box locations:

| Box number | Location |
|---|---|
| 1 | Sourdnahunk Falls |
| 2 | Sourdnahunk Deadwater/Horserace Campsite |
| 3 | Telos Bridge North Side Trail - Washing Machine |
| 4 | Holbrook Pool |
| 5 | Little Eddy |
| 6 | McKay Station Parking area |
| 7 | Rip Dam- Upper Gorge Trail |
| 8 | Big Eddy Campground |

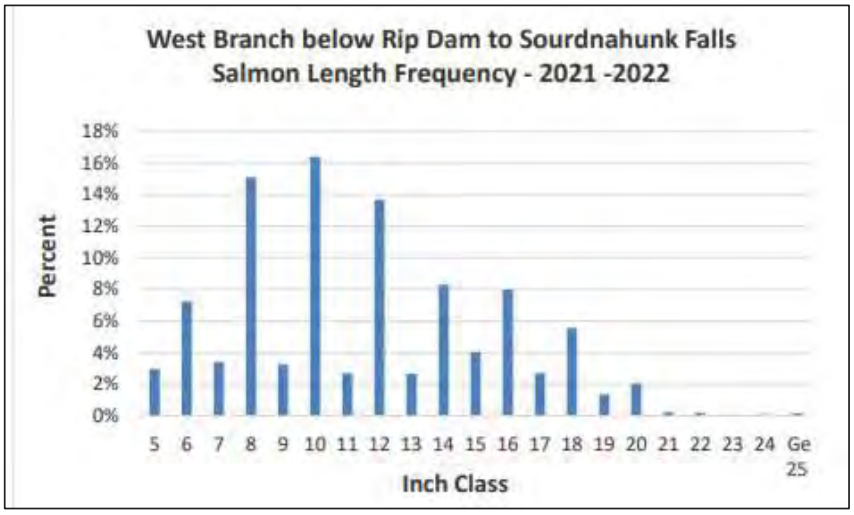
Data Summary:

| | 2021 | 2022 |
|---|---|---|
| Parties | 356 | 216 |
| Anglers | 612 | 358 |
| Total Hours | 1545 | 762 |
| | | |
| Salmon Kept | 1 | 0 |
| Salmon Released | 863 | 748 |
| | | |
| Brook Trout Kept | 4 | 1 |
| Brook Trout Released | 178 | 75 |
| | | |
| All Salmon/hr | 0.76 | 0.99 |
| All Brook Trout/hr | 0.15 | 0.13 |

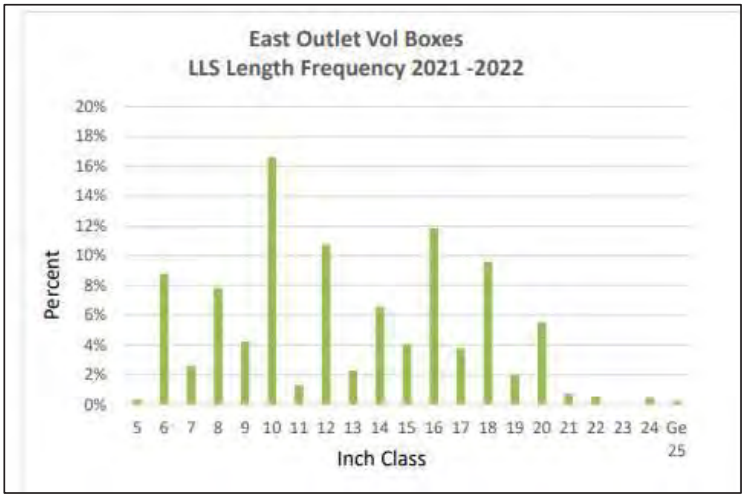
For comparison, these are the catch rates for landlocked salmon and brook trout in 2021 and 2022 from the nearby Moose River and East Outlet of the Kennebec River, which both have similar fisheries and similar clientele:

| | Moose River | East Outlet |
|---|---|---|
| All Salmon/hr | 0.37 | 0.49 |
| All Brook Trout/hr | 0.14 | 0.22 |

Below is the length frequency from angler caught fish reported in the voluntary boxes in the West Branch in 2021 and 2022. It is typical of a river system with all life stages of salmon present:



Length frequency data from the East Outlet of the Kennebec River is very similar to the West Branch of the Penobscot River:




MDIFW did not request angler surveys on the Ripogenus Impoundment because, as mentioned during previous meetings and in our filings, we have ample angler survey data, including summer and winter data as recent as 2021, to characterize the fishery. These surveys include CPUE, angler use, harvest, and age/growth data. As the Agency responsible for the management of the inland fisheries, MDIFW believes we have the information currently needed to assess the fishery and respond with management changes as necessary. We did not feel it would be useful to have outside sources (i.e., the Licensee) collect that information for one year, nor did we have the available staff or equipment to conduct a clerk survey in 2023. That said, we do plan to return to the Ripogenus Project and West Branch of the Penobscot River in 2025. We typically try to sample our larger waters, such as the Ripogenus Impoundment, every few years, with the exception being Moosehead Lake, which requires annual attention from our limited number of full-time staff. Therefore, sampling other waters relies on availability of additional funds for temporary staff. It is difficult to execute a basic, long-term fisheries management plan that would include angler surveys on the lake and river, trapnetting tributaries for salmon age/growth/abundance, and smelt drift estimates below McKay Station with the uncertainty in funding.

Smelt Entrainment

MDIFW knows from past studies that smelt drift (entrainment) from the Ripogenus Impoundment through McKay Station is essential to maintain growth of the downstream landlock salmon population. Studies conducted by Great Northern Paper (1985 - 1989, 1999 - 2001, and by MDIFW (2021) clearly demonstrate that hundreds of thousands of smelt from the Ripogenus Impoundment drift downstream and provide forage for the resident salmon population. Landlocked salmon rely on smelt for forage, to the exclusion of almost all other fish species. It has been well-documented that salmon growth, and sometimes survival, declines when smelt are less abundant. Smelt do not typically live in a river environment year-round and there are few, if any, resident smelt in the river itself. Therefore, it is critical to maintain smelt drift from the Ripogenus Impoundment. During our May 5, 2023, site visit to the Project with FERC staff, we stopped at the Holbrook Pool area and observed many gulls swooping down to pick up smelt that were drifting downstream from McKay. These fish are the primary food source for the West Branch salmon, especially in the colder seasons of the year when insects are less abundant. Any

efforts to reduce entrainment at Ripogenus Dam will likely have dire consequences on the important salmon sport fishery in the West Branch of the Penobscot River below the dam.

Fish Assemblage Study Discussion

From MDIFW's perspective, the results from the Fish Assemblage Study were as expected. The fish species identified by GLHA in the Ripogenus Impoundment and the West Branch below the Ripogenus Impoundment are consistent with MDIFW's species inventory for these waters and are typical of waters in that region. We understand this study was intended to simply identify species and not provide any meaningful indices of abundance, which would be impossible given the size of the lake, and the various species and life histories involved.

Flow data - Ramping/Peaking

MDIFW is concerned with potential changes in Project operations since the Millinocket paper mills closed that might increase the frequency and rate of flow changes in the West Branch below McKay Station. GLHA has recently provided hourly flow data for review, and MDIFW analyses of those data indicate that the majority of flow changes (increase or decrease) do not appear to exceed 25% of the initial flow. This criterion (25% of existing flow) is based on existing ramping studies. Smokorowski[1] compared biotic factors from a regulated river to a nearby unregulated river. In the regulated river, the summer ramping rates were limited to 25% of the previous hours flow. The report concluded that: *"Constrained ramping operations result in changes to the flow regime that on the whole are ecologically protective as indicated by some of the measured biological metrics reported here for the Magpie River. Invertebrate abundance and diversity, fish biomass, fish condition, and food web length were all equal to or greater than our unaltered system, and some metrics that differed between rivers, specifically isotope signatures, were attributed to the presence of the reservoir and not to flow alterations."*

Based on MDIFW's analyses, of the 192,000+ flow observations from McKay Station analyzed to compare flow at hour(n) to hour(n+1), less than 2% exceeded a change in discharge greater than 25%. The data were broken down by period as follows:

Period 1: 2000 – 2007 (mills operational)
Period 2: 2008 – 2013 (transitioning period – mills closing)
Period 3: 2014 – 2022 (post-mill operation)

The results were as follows:

NUMBER OF HOURLY FLOW OBSERVATIONS AND PERCENT EXCEEDING 25% OF EXISTING FLOW 2000-2022

| PERIOD | TOTAL OBS | NUMBER OF FLOW CHANGES EXCEEDED 25% | PERCENT |
|---|---|---|---|
| 1 | 66,964 | 1,079 | 1.6 |
| 2 | 50,353 | 522 | 1.0 |
| 3 | 75,361 | 800 | 1.1 |
| ALL | 192,678 | 2,401 | 1.2 |

[1] Smokorowski, K. & Metcalfe, Robert & Finucan, S. & NE, Jones & Marty, Jerome & Pyrce, R. & Steele, R. (2011). Ecosystem level assessment of environmentally based flow restrictions for maintaining ecosystem integrity: A comparison of a modified peaking versus unaltered river. Ecohydrology. 4. 791 - 806. 10.1002/eco.167.

The flow data were also examined to determine the number of days where a flow change exceeded the 25% threshold. The results were as follows:

NUMBER OF DAYS WITH HOURLY FLOW CHANGES THAT EXCEEDED 25% OF EXISTING FLOW
2000-2022

| PERIOD | TOTAL NUMBER OF DAYS WITH AN HOURLY FLOW CHANGE EXCEEDING 25% | PERCENT |
|---|---|---|
| 1 | 620 | 21.2 |
| 2 | 334 | 15.3 |
| 3 | 490 | 14.9 |
| ALL | 1,444 | 17.2 |

This analysis of all the observations would indicate that any perceived changes in flow management since the mill closures have not resulted in more frequent occurrences of hourly flow changes greater than 25%. Still, the current 14.9% of days with flow changes greater than 25% represents an opportunity for improvement in the future license.

Data:
https://docs.google.com/document/d/18OOVyBwJEuYZfvYrleh0_bGuEhZrTKTH/edit?usp=sharing&ouid=105676831579502917997&rtpof=true&sd=true

Stranding Study/Low Flow Events

Based on MDIFW's analyses of data between 2000 and 2022, there were 40 days with a low flow event of 500 cfs or less (**Table 1 below**). This seems high compared to other hydro and storage facilities in the Region. There were many other days where the flow was between 500 – 1000 cfs, but it is clear these low flow days were the result of drought conditions and flows were likely reduced with consultation (i.e., many consecutive days during dry years where the flow was stable but less than the minimum flow of 1,000 cfs.)

In light of this new information made available after the ISR meeting, MDIFW requested GLHA to provide a brief description/clarification of the cause of the low flow events on these 40 days. As documented in the Stranding Study, flow excursions to 500 cfs and lower can cause significant disturbance and mortality. These events appear to have occurred in 17 of 23 years in the sample which likely led to significant losses of young landlocked salmon (multiple age classes), brook trout, and other species. Many of these low flow events may be unavoidable, but future low flow events should be minimized and, in some cases, be mitigated for in the upcoming license.

**Table 1. Low Flow Events - 2000 to 2022**

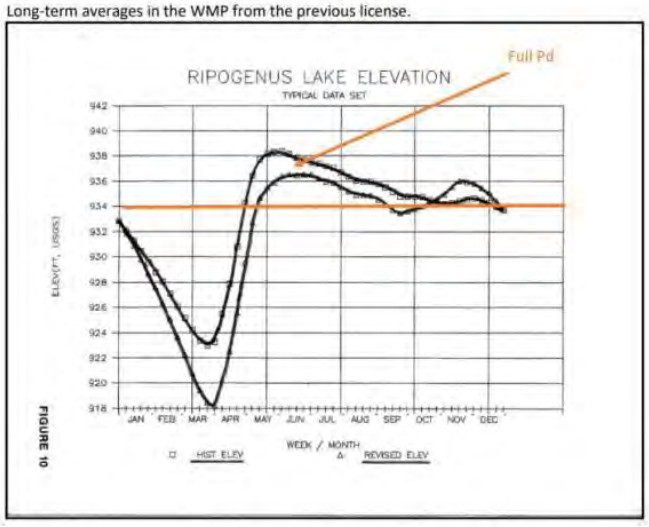
| Obs | Date | Total Flow |
|---|---|---|
| 1 | 18DEC2000 | 266 |
| 2 | 17JUN2001 | 465 |
| 3 | 30MAY2002 | 400 |
| 4 | 07JUN2002 | 400 |
| 5 | 15DEC2002 | 400 |
| 6 | 10JAN2003 | 400 |
| 7 | 03MAR2003 | 224 |
| 8 | 14FEB2007 | 260 |
| 9 | 06MAR2007 | 120 |
| 10 | 17MAR2007 | 400 |
| 11 | 04JAN2008 | 400 |
| 12 | 03JAN2010 | 400 |
| 13 | 25MAY2010 | 400 |
| 14 | 27MAY2011 | 5 |
| 15 | 06JUL2011 | 200 |
| 16 | 20AUG2011 | 100 |
| 17 | 21AUG2011 | 106 |
| 18 | 24SEP2011 | 106 |
| 19 | 11OCT2012 | 255 |
| 20 | 17OCT2012 | 223 |
| 21 | 21OCT2013 | 406 |
| 22 | 16JUN2014 | 137 |
| 23 | 04OCT2014 | 167 |
| 24 | 26FEB2015 | 138 |
| 25 | 01APR2015 | 6 |
| 26 | 13JUN2015 | 1 |
| 27 | 14JUN2015 | 68 |
| 28 | 16JUL2015 | 150 |
| 29 | 13AUG2015 | 150 |
| 30 | 03SEP2015 | 150 |
| 31 | 09SEP2015 | 150 |
| 32 | 18NOV2015 | 253 |
| 33 | 13MAY2016 | 8 |
| 34 | 15MAR2017 | 15 |
| 35 | 14MAR2018 | 26 |
| 36 | 18MAR2020 | 269 |
| 37 | 10JUN2020 | 344 |
| 38 | 30SEP2020 | 287 |
| 39 | 05DEC2020 | 88 |
| 40 | 28OCT2022 | 332 |

Lake Elevation Data - Ripogenus Impoundment Elevations Analysis

In their PAD, GLHA states that the lake elevations remain "*relatively stable*". The old Water Management Plan (WMP) curve below shows an approximate long term average drawdown from May to September of approximately 4 feet.

Based on the revised data in the old WMP, full pond is closer to 936.5 feet, and the lake elevation should stay above approximately 934 feet during the growing/recreation season of May to September. That elevation is depicted on the following chart along with the actual lake elevations.

Long-term averages in the WMP from the previous license.




Examining the recent data provided by GLHA (see tables below), the summer drawdown on the impoundment ranged from approximately 4 – 19 feet from 2000 to 2022. There was only 1 year in which the total drawdown was near 4 feet. The tables below show that the mean drawdown during May-September is higher in Period 3 (post mill operation). This Period also includes 2020 and 2021, two severe drought years. When the drought years are removed from the analysis, the mean difference in summer drawdowns from Period 1 and Period 3 is 0.6 feet.

Mean drawdown on Rip Impoundment by Period for May-Sept
All Years

| | ELEVATION | |
|---|---|---|
| | min | max |
| YEAR | | |
| 2000 | 929.77 | 941.68 |
| 2001 | 921.27 | 931.12 |
| 2002 | 930.11 | 938.67 |
| 2003 | 928.32 | 938.07 |
| 2004 | 929.55 | 934.55 |
| 2005 | 930.92 | 941.23 |
| 2006 | 935.48 | 942.18 |
| 2007 | 930.10 | 941.08 |
| 2008 | 937.24 | 941.25 |
| 2009 | 935.25 | 941.31 |
| 2010 | 924.25 | 940.81 |
| 2011 | 934.90 | 941.39 |
| 2012 | 929.71 | 941.03 |
| 2013 | 933.69 | 940.99 |
| 2014 | 933.51 | 941.39 |
| 2015 | 929.31 | 937.58 |
| 2016 | 928.87 | 939.55 |
| 2017 | 932.80 | 941.19 |
| 2018 | 925.21 | 940.65 |
| 2019 | 932.43 | 941.08 |
| 2020 | 920.83 | 940.27 |
| 2021 | 920.36 | 933.99 |
| 2022 | 931.97 | 940.86 |

Period 1: 2000-2007 (pre-mill closure)
Period 2: 2008 - 2013 (transitioning mills)
Period 3: 2014- 2022 (mills closed)

Mean drawdown on Rip Impoundment by Period for May-Sept
All Years

| Obs | YEAR | ELEVATION_ Min | ELEVATION_ Max | diff | period |
|---|---|---|---|---|---|
| 1 | 2000 | 929.77 | 941.68 | 11.91 | 1 |
| 2 | 2001 | 921.27 | 931.12 | 9.85 | 1 |
| 3 | 2002 | 930.11 | 938.67 | 8.56 | 1 |
| 4 | 2003 | 928.32 | 938.07 | 9.75 | 1 |
| 5 | 2004 | 929.55 | 934.55 | 5.00 | 1 |
| 6 | 2005 | 930.92 | 941.23 | 10.31 | 1 |
| 7 | 2006 | 935.48 | 942.18 | 6.70 | 1 |
| 8 | 2007 | 930.10 | 941.08 | 10.98 | 1 |
| 9 | 2008 | 937.24 | 941.25 | 4.01 | 2 |
| 10 | 2009 | 935.25 | 941.31 | 6.06 | 2 |
| 11 | 2010 | 924.25 | 940.81 | 16.56 | 2 |
| 12 | 2011 | 934.90 | 941.39 | 6.49 | 2 |
| 13 | 2012 | 929.71 | 941.03 | 11.32 | 2 |
| 14 | 2013 | 933.69 | 940.99 | 7.30 | 2 |
| 15 | 2014 | 933.51 | 941.39 | 7.88 | 3 |
| 16 | 2015 | 929.31 | 937.58 | 8.27 | 3 |
| 17 | 2016 | 928.87 | 939.55 | 10.68 | 3 |
| 18 | 2017 | 932.80 | 941.19 | 8.39 | 3 |
| 19 | 2018 | 925.21 | 940.65 | 15.44 | 3 |
| 20 | 2019 | 932.43 | 941.08 | 8.65 | 3 |
| 21 | 2020 | 920.83 | 940.27 | 19.44 | 3 |
| 22 | 2021 | 920.36 | 933.99 | 13.63 | 3 |
| 23 | 2022 | 931.97 | 940.86 | 8.89 | 3 |

Period 1: 2000-2007 (pre-mill closure)
Period 2: 2008 - 2013 (transitioning mills)
Period 3: 2014- 2022 (mills closed)

Mean drawdown on Rip Impoundment by Period for May-Sept
All Years

| | diff | | |
|---|---|---|---|
| | Mean | Min | Max |
| Period | | | |
| 1 | 9.13 | 5.00 | 11.91 |
| 2 | 8.62 | 4.01 | 16.56 |
| 3 | 11.25 | 7.88 | 19.44 |

Period 1: 2000-2007 (pre-mill closure)
Period 2: 2008 - 2013 (transitioning mills)
Period 3: 2014- 2022 (mills closed)

Mean drawdown on Rip Impoundment by Period for May-Sept
Removed drought years (nontypical)- 2001, 2002, 2020, 2021

| Obs | YEAR | ELEVATION_ Min | ELEVATION_ Max | diff | period |
|---|---|---|---|---|---|
| 1 | 2000 | 929.77 | 941.68 | 11.91 | 1 |
| 2 | 2003 | 928.32 | 938.07 | 9.75 | 1 |
| 3 | 2004 | 929.55 | 934.55 | 5.00 | 1 |
| 4 | 2005 | 930.92 | 941.23 | 10.31 | 1 |
| 5 | 2006 | 935.48 | 942.18 | 6.70 | 1 |
| 6 | 2007 | 930.10 | 941.08 | 10.98 | 1 |
| 7 | 2008 | 937.24 | 941.25 | 4.01 | 2 |
| 8 | 2009 | 935.25 | 941.31 | 6.06 | 2 |
| 9 | 2010 | 924.25 | 940.81 | 16.56 | 2 |
| 10 | 2011 | 934.90 | 941.39 | 6.49 | 2 |
| 11 | 2012 | 929.71 | 941.03 | 11.32 | 2 |
| 12 | 2013 | 933.69 | 940.99 | 7.30 | 2 |
| 13 | 2014 | 933.51 | 941.39 | 7.88 | 3 |
| 14 | 2015 | 929.31 | 937.58 | 8.27 | 3 |
| 15 | 2016 | 928.87 | 939.55 | 10.68 | 3 |
| 16 | 2017 | 932.80 | 941.19 | 8.39 | 3 |
| 17 | 2018 | 925.21 | 940.65 | 15.44 | 3 |
| 18 | 2019 | 932.43 | 941.08 | 8.65 | 3 |
| 19 | 2022 | 931.97 | 940.86 | 8.89 | 3 |

Period 1: 2000-2007 (pre-mill closure)
Period 2: 2008 - 2013 (transitioning mills)
Period 3: 2014- 2022 (mills closed)

Mean drawdown on Rip Impoundment by Period for May-Sept
Removed drought years (nontypical)- 2001, 2002, 2020, 2021

| | diff | | |
|---|---|---|---|
| | Mean | Min | Max |
| Period | | | |
| 1 | 9.11 | 5.00 | 11.91 |
| 2 | 8.62 | 4.01 | 16.56 |
| 3 | 9.74 | 7.88 | 15.44 |

Period 1: 2000-2007 (pre-mill closure)
Period 2: 2008 - 2013 (transitioning mills)
Period 3: 2014- 2022 (mills closed)

***Penobscot Mills Project Comments***

North Twin Impoundment Tributary Access Survey Study

In the Initial Study Request MDIFW proposed a Comprehensive Impoundment Landlocked Salmon Habitat Use/Spawning Study be conducted. This proposal, in part, called for capturing, radio tagging, and monitoring landlocked salmon in the North Twin headpond, an 18,300-acre waterbody comprised of five continuous waters: Ambajejus, Pemadumcook, North Twin, South Twin, and Elbow Lakes. However, the Licensee modified the original proposal and removed the radio tagging portion of the study which would have indicated habitat use of landlocked salmon within the Project area. Instead, the Licensee proposed,

and FERC accepted, a North Twin Impoundment Tributary Access Survey Study to document whether Project operations on headpond water levels affect salmon access to tributaries during fall spawning activities.

During 2022 discussions, MDIFW and the Licensee identified eight tributaries at the North Twin Impoundment which might contain landlocked salmon spawning habitat. After the Summer 2022 field assessment of identified tributaries, it was determined by the Licensee and MDIFW that the fall spawning surveys would concentrate on three tributaries with adequate salmon spawning habitat: West Branch Penobscot River, Nahmakanta Stream, and Jo-Mary Stream. The remaining five tributaries were determined not to be suitable for salmonid spawning and therefore no follow-up fall spawning surveys were warranted. However, as discussed during the ISR Meeting, and as stated in Appendix G: North Twin Impoundment Tributary Access Survey Study contained in the ISR: "*Field conditions were unsuitable in fall 2022 for completing the tributary surveys. Extended rainfall in October and November 2022 resulted in abnormally high impoundment water elevations and high tributary runoff that precluded surveying. Brookfield anticipates conducting this survey in 2023."*

Radio tagging a small number of landlocked salmon at the North Twin Impoundment, as suggested in the original study request proposed by MDIFW, would have possibly yielded some insightful data in the fall of 2022 during "abnormally high" water levels. It is generally accepted that salmon utilize large inlets and outlets for spawning and rearing.[2] However, it has also been documented that landlocked salmon will spawn in lakes, especially near mouths of large inlets, in moving water near outlets, and among wind-swept shoals (Boucher and Warner). The Licensee's methodology to conduct a tributary access study, without radio tagging salmon, will not identify whether spawning activity is occurring within the lacustrine habitat of the North Twin Impoundment, especially if salmon are utilizing unknown shoals, and if Project operations are impacting these areas.

Realizing the inability to proceed with the present study in 2022, and that potential unpredictable environmental conditions could take place again in the fall of 2023, MDIFW is re-requesting that the Licensee radio tag landlocked salmon (sample size and sex ratios to be determined through consultation) as part of a Landlocked Salmon Habitat Use/Spawning Study (below), as originally submitted. Relying on visual redd counts alone will not yield reliable information related to what effects, if any, fall impoundment-level fluctuations may have on salmonid spawning success. Surveying tributaries by sight alone will not provide data related to potential lacustrine-based spawning activities.

**Riparian and Littoral Habitat Assessment Study Discussion—Ripogenus and Penobscot Mills Projects**

MDFW appreciates the efforts showing that the Riparian and Littoral Habitat Assessment documented ongoing impacts to wetlands in the impoundments of the Projects, as expected. Under the existing license, after a series of studies and resulting reports, wetland impacts were mitigated mainly via the discontinued storage-and-release operation at Umbazooksus Lake in Spring 1998 by maintaining the outlet gate in a permanently opened position, resulting in a run-of-river regime to lower water levels and enhance wetlands at Umbazooksus Lake. Subsequent monitoring indicated that wetland vegetation and species richness increased, and it was estimated that 320 acres of wetlands were recovered.

[2] Boucher, David and Warner, Kendall, "Maine Landlocked Salmon : Life History, Ecology, and Management" (2006). Inland Fisheries and Wildlife Documents. 65. https://digitalmaine.com/ifw_docs/65

However, as requested in our October 8, 2021, Study Requests and as reiterated in our April 7, 2022, Revised Study Plan Comments, MDIFW expressed the need to document impacts resulting from Project operations to the West Branch of the Penobscot River downstream of Ripogenus Project to the Penobscot Mills Project, as well as the West Branch below Stone Dam and Millinocket Stream, and to associated riverine wetland habitats. It is our understanding that this aspect was not considered as part of the overall Riparian and Littoral Habitat Assessment, and MDIFW again reiterates our concern to account for impacts to these resources and the species that occupy or potentially occupy these resources. To restate, many of documented, modeled, and predicted State Species of Greatest Conservation Need (SGCN, see below), including State Threatened aquatic or aquatic-associated invertebrate species in the Project area, require specialized experience, specific survey protocols, and proper seasonality to detect, and most of these species below, if present, will not be documented through general wildlife surveys. As part of this relicensing effort, MDIFW is considering comprehensive minimization efforts and mitigation scenarios for the new licenses accounting for lacustrine, palustrine, and riverine habitat impacts and for the species, including SGCN species, that utilize these habitats, based on our current management objectives and current mitigation requirements. One aspect of possible mitigation that MDIFW is considering is the Umbazooksus Lake mitigation area, and we are exploring whether this site alone is adequate to account for anticipated impacts from future operations for all species and varying habitats affected by operations of both Projects. To that end, MDIFW is requesting a new study (below) to evaluate the Umbazooksus Lake mitigation component of the current license to see if this area can be further enhanced as a mitigation component for the new Ripogenus Project license.

| | | |
|---|---|---|
| 1 | *Aeshna juncea* | Sedge Darner |
| 2 | *Alasmidonta undulata* | Triangle Floater |
| 3 | *Alasmidonta varicosa* | Brook Floater |
| 5 | *Ameletus browni* | A Mayfly |
| 6 | *Anodonta implicata* | Alewife Floater |
| 7 | *Baetisca berneri* | A Mayfly |
| 8 | *Baetisca lacustris* | A Mayfly |
| 9 | *Baetisca rubescens* | A Mayfly |
| 10 | *Boloria frigga saga* | Frigga Fritillary |
| 11 | *Cicindela ancocisconensis* | White Mountain Tiger Beetle |
| 12 | *Cicindela marginipennis* | Cobblestone Tiger Beetle |
| 13 | *Enallagma carunculatum* | Tule Bluet |
| 14 | *Enallagma laterale* | New England Bluet |
| 15 | *Enallagma pictum* | Scarlet Bluet |
| 16 | *Epeorus frisoni* | Roaring Brook Mayfly |
| 17 | *Lampsilis cariosa* | Yellow Lampmussel |
| 18 | *Lanthus vernalis* | Southern Pygmy Clubtail |
| 19 | *Leptodea ochracea* | Tidewater Mucket |
| 20 | *Leucorrhinia patricia* | Canada Whiteface |
| 21 | *Lycaena dorcas claytoni* | Clayton's Copper |
| 22 | *Margaritifera margaritifera* | Eastern Pearlshell |
| 23 | *Metretopus borealis* | A Mayfly |
| 24 | *Ophiogomphus colubrinus* | Boreal Snaketail |
| 25 | *Ophiogomphus howei* | Pygmy Snaketail |
| 26 | *Papilio brevicauda gaspeensis* | Short-tailed Swallowtail |
| 27 | *Parameletus midas* | A Mayfly |
| 28 | *Procloeon ozburni* | A Mayfly |
| 29 | *Rhithrogena undulata* | A Mayfly |
| 30 | *Siphlonisca aerodromia* | Tomah Mayfly |
| 31 | *Siphlonurus barbaroides* | A Mayfly |
| 32 | *Siphlonurus barbarus* | A Mayfly |
| 33 | *Siphlonurus demaryi* | A Mayfly |
| 34 | *Siphlonurus securifer* | A Mayfly |
| 35 | *Somatochlora brevicincta* | Quebec Emerald |
| 36 | *Stagnicola mighelsi* | Bigmouth Pondsnail |
| 37 | *Vertigo paradoxa* | Mystery Vertigo |

***New Study Requests***

We respectfully request that FERC adopt the following New Study Requests below. To be clear, our Agency is utilizing this limited period of time between 30- to 50-year Federal licenses to become better informed on how current Project operations are affecting inland fisheries and wildlife resources and their respective habitats in the Project areas, as well as better understand public access and use at the Projects.

**New Study (Information) Request 1: USGS gage feasibility study—Ripogenus Project**

1. We recommend GLHA work with the appropriate USGS representatives to provide an estimate of cost for a new USGS gage on the West Branch of the Penobscot River at a location below McKay Station and above Big Eddy Campground. The goal of this "study" is to eliminate the significant stakeholder confusion around the issue of monitoring discharge in the river and the methodology for estimating the flow at the Ripogenus Project, as discussed during the ISR meeting in May 2023.

2. This is an important, heavily regulated river system with multiple agency and user group interests, oftentimes with competing goals. A standard USGS gage in the system where river flow and Ripogenus Impoundment elevations at 15-minute intervals could be accessible on the USGS website would be invaluable for these groups, allow for a level of predictability for all users, as well as for determining compliance, particularly during climatic extremes. The first step in implementing a gage is to understand the costs and logistics of installing one in this remote region.

3. MDIFW is a cabinet level agency of the State of Maine. Under Maine State Law (12 MRSA, §10051), MDIFW's mandate is *"…to preserve, protect, and enhance the inland fisheries and wildlife resources of the State; to encourage the wise use of these resources; to ensure coordinated planning for the future use and preservation of these resources; and to provide for effective management of these resources."*

4. Prior to the ISR meeting, it was unknown to stakeholders how discharge was calculated from the Ripogenus Project. It was apparent to all stakeholders who attended the ISR meeting that the determination of discharge from the Project is still not easily ascertainable to the layperson. Understanding the costs associated with a USGS gage is the critical first step in exploring the installation of a new gage for the next license.

5. Understanding real-time discharges allows the resource and regulatory community to make more informed management decisions, especially during extreme climatic conditions which appear to be occurring in greater frequencies. A USGS gage would also allow multiple interested users to better understand the amounts and durations of any license compliance deviations.

6. We are unsure if this request has been made at other hydro facilities in Maine. We do not consider this as a true "study request" in the scientific sense.

7. The level of effort and cost is commensurate with a project the size of the Ripogenus Project and the probable license term. We anticipate a relatively straightforward process of the Licensee connecting with the appropriate staff at the USGS, determine the proper and practical location for a new gage, and the estimated costs of installing a gage in this region. We anticipate no more than 5 days of communications, including time to prepare a report memo which documents staff correspondence, proposed locations for a gage, associated costs for installing a gage, and any alternatives for installing a gage.

**New Study Request 2: Recreation Study/Winter Access Study—Ripogenus Project**

1. MDIFW requests an updated evaluation of wintertime angling access at the Ripogenus Impoundment. MDIFW believes winter angling and snowmobile access is limited at the Chesuncook Point access site, which is the primary access site to the Ripogenus Impoundment in the winter. It is important to maintain and promote winter angling and access on the impoundment. It is currently MDIFW's goal to increase harvest of salmon in the impoundment, and most of the annual salmon harvest occurs in the winter months.

2. In addition to responsibilities regarding inland fisheries management, MDIFW is charged with improving and securing public access to waters of the State of Maine. This wintertime study is requested because MDIFW is concerned that use was under-represented this past winter as the ice formed very late making it unsafe for travel through all of January; as a result, winter use was reduced in 2023 and therefore atypical during GLHA's Recreation Study period.

3. MDIFW is a cabinet level agency of the State of Maine. Under Maine State Law (12 MRSA, §10051), MDIFW's mandate is *"…to preserve, protect, and enhance the inland fisheries and wildlife resources of the State; to encourage the wise use of these resources; to ensure coordinated planning for the future use and preservation of these resources; and to provide for effective management of these resources."*

4. From our Agency's perspective, it is important to document current, accurate, and quantitative use during the winter as most of the annual salmon harvest at the Project occurs during the winter. As stated above, winter use of the Project area during the original Study period was not typical due to late formation of ice.

5. Operation of the Ripogenus Project has a direct impact on public recreation both above and below the dam. Given our Agencies management goal of increasing the harvest of salmon at the impoundment, understanding snowmobile access and use at the Chesuncook Point access site is critical to our management objective and the promotion of this resource.

6. Public recreation studies are a mainstay in FERC hydroelectric relicensing, and these data are basic, yet crucial to understanding how winter recreationalists access the area, utilize the area, if access is adequate, and what impacts the Project may have on those activities. The survey should include site visits on each Saturday between 10:00 am – 1:00 pm from January 15th through March 31st. The Study should include evaluating the capacity at the parking area and ease of access/conditions from the Golden Road. The access road is narrow, and at times difficult for two vehicles with trailers to pass each other.

7. The associated cost of this evaluation is commensurate with a project the size of the Aziscohos Hydroelectric Project and the likely license term. MDIFW is asking for additional information collection during this effort to ensure adequate wintertime public access over the life of the new license. It should be noted that MDIFW is not requesting a user contact survey which is both labor intensive and costly. Instead, we request the Licensee collect information on all recreation access points and determine overall use by area and user type.

**New Study Request 3: Umbazooksus Lake Mitigation Evaluation**

1. As provided in the initial Riparian and Littoral Habitat Assessment Study report, Project operations continue to impact the quantity, quality, and function of Project wetlands. The goal of this Study

Request is to evaluate Umbazooksus Lake as a possible wetland mitigation component for the new license, including evaluating potential enhancements. As such, we are requesting the following:

1.) Provide a map of the current locations of the wetlands that exist at Umbazooksus Lake.
2.) Provide a summary of the wetland acres by wetland type.
3.) Provide an analysis of the feasibility of adding increased water on this impoundment, by using splash boards or similar alterations to the current dam, to add one to four feet of additional water on this impoundment, in one-foot increments.
4.) Provide an analysis of the potential change in wetland acres by type, and location, when adding each incremental foot of additional water.

It should be noted that it was our Agency's understanding that that the proposed Umbazooksus Lake mitigation area, as well as the Penobscot Mills Wildlife Management Area, would be considered conserved in perpetuity; this misunderstanding was corrected during the ISR meeting when we were informed that for FERC relicensing purposes, mitigation is considered license term to license term. This new understanding is some of the reasoning behind this Study Request.

2. MDIFW is the natural resource agency responsible for managing inland fish and wildlife resources in the State of Maine, with "wildlife" defined as all animals, including insects and other macroinvertebrates, as well as the habitats necessary to complete their life history requirements. It is anticipated that ongoing Project operations will continue to impact natural resources; therefore, appropriate mitigation will be necessary after all practicable avoidance and minimization efforts have been realized.

3. MDIFW is a cabinet level agency of the State of Maine. Under Maine State Law (12 MRSA, §10051), MDIFW's mandate is *"…to preserve, protect, and enhance the inland fisheries and wildlife resources of the State; to encourage the wise use of these resources; to ensure coordinated planning for the future use and preservation of these resources; and to provide for effective management of these resources."*

4. As part of the last license for the Ripogenus Project, FERC required the Licensee to provide wetland mitigation for Project operational impacts on wetlands. This included removing Umbazooksus Lake as a storage impoundment for the Project by permanently opening the gate in the dam to allow for run-of-the river flows to potentially enhance wetland acres. According to the reports of follow up assessments on wetlands in Umbazooksus Lake from 1998-2004, this procedure increased wetland acres and plant species diversity within wetlands. MDIFW is interested in evaluating whether the Umbazooksus Lake mitigation area, including the incremental water levels increases as proposed to be studied, will be commensurate not only in acreage, but also in composition and functionality to species being impacted by Project operations, with the anticipated impacts that will occur during the 30–50-year term of the new license.

5. It is anticipated that wetland impacts, including anticipated impacts to the species which utilize these habitats, will likely occur during the term of the new license. Therefore, an evaluation of mitigation proposals, including an evaluation of Umbazooksus Lake enhancements, to offset possible impacts to Threatened, Special Concern, and SGCN species, as well as aquatic furbearers, is necessary.

6. After avoidance and minimization efforts have been realized, a discussion and assessment of perspective mitigation scenarios is common during the relicensing process. The Umbazooksus Lake area served as mitigation for wetland impacts for the current license, but as our understanding regarding the occurrence, distribution, and abundance of species and their habitat requirements has broadened since the issuance of the current license, our Agency's management objectives and focus has changed. As our

understanding has grown, exploring mitigation for the current license may not be sufficient for the future license

7. MDIFW asserts that the level of cost and effort is commensurate given the current and proposed operations of the Project. While near accuracy is of the utmost importance, MDIFW envisions that a desktop, GIS-based exercise will be sufficient for completing the evaluation. As additional water at 1-foot increments (up to 4 feet, with the existing regime as the baseline) at Umbazooksus Lake are evaluated, inclusion of any aerial imagery existing photographs would also prove instructive. The results should include descriptions of acreages and compositions of modeled wetland types released at each level evaluated, as well as a narrative of expected wildlife resources expected to utilize each wetland type. We estimate that this effort would likely require several days of GIS analyses, review, and reporting to summarize findings.

**New Study Request 4: Penobscot Mills Bypass Channel Fishability/Wadability Study**

1. The goal of this study is to inform the decision process for determining the suitable range of flows that allows for the safe wadability and fishability in the West Branch of the Penobscot River downstream of Stone Dam (Bypass Reach). MDIFW is looking to maximize fishery resources in terms of both aquatic habitat and fishable opportunities in this reach of river.

2. Concurrent with the perspective minimum flow findings of the Instream Flow and Habitat Assessment of West Branch Downstream of Stone Dam Study (Habitat Assessment Study), this study is requested to ensure that any agreed upon flow releases in the ranges of the identified suitable flows for salmonids occur at levels that are wadable and fishable while maintaining adequate habitat. The Habitat Assessment Study identified Aquatic Base Flow for this portion of the West Branch at 700-800 cfs. Given the nature of this reach of river and given that the current minimum flows are far below this range under the current license so that a fishery was not able to be established, assessment of fishability has not been undertaken to date.

3. MDIFW is a cabinet level agency of the State of Maine. Under Maine State Law (12 MRSA, §10051), MDIFW's mandate is *"…to preserve, protect, and enhance the inland fisheries and wildlife resources of the State; to encourage the wise use of these resources; to ensure coordinated planning for the future use and preservation of these resources; and to provide for effective management of these resources."*

4. Under the existing FERC license, minimum flows are not required in the Bypass Reach. The Bypass Reach is a 4.5-mile-long reach downstream of Stone Dam (Millinocket Impoundment) that flows into Shad Pond. The results of the Habitat Assessment Study indicates that a flow of approximately 700 cfs appears optimal for landlocked salmon; however, flows that are optimal for fish may not be suitable for wading fishermen. Anticipating a future minimal flow release requirement for Stone Dam, MDIFW will explore a limited salmonid stocking program in this stretch of the West Branch Penobscot River. Given the rugged nature of this reach of river, lack of previous flow-rate data and site-specific information, a fishability/wadability study is necessary to evaluate safe angler access to, and within, this stream reach before a stocking program could be implemented.

5. Fishability studies are often required during relicensing proceedings as daily, or seasonal, project operations can directly influence angling opportunities. An evaluation of fishability is necessary to determine how to best assess suitable and safe fishability/wadability flows, while maintaining adequate salmonid habitat through various project water releases at Stone Dam. Through this study, if a suitable

wading flow can be identified, there will likely be a need for improved vehicle access to the river stretch below Stone Dam as well as prominent safety signage alerting anglers of possible river level and flow fluctuations based on project operational needs.

6. This study request may parallel other stakeholder study requests and should be a collaborative effort between MDIFW, other interested parties, and the Licensee. Therefore, the study details, including the actual methodology, should be developed after a review of any similar study requests to minimize redundancy and meet the collective need for flow suitability analyses. However, for the purpose of more clearly addressing expectations, MDIFW envisions a Fishability Study consisting of experienced and lay-anglers assessing an agreed-upon range of flows at various locations within the Bypass Reach. Whereas a fishery has not been established in this reach, MDIFW also envisions potential assessment sites to be identified by ISR researchers and Brookfield staff familiar with this river reach. MDIFW and interested resource agency staff and anglers, along with the Licensee, could visually rate various flow(s) with the intent of identifying a range of suitable fishing flows. The actual test flows would be selected through a collaborative process involving MDIFW, other interested parties, and the Licensee.

7. The level of effort and cost is commensurate with a project the size of the Penobscot Mills Project and the likely license term. Several days of field work and subsequent analyses may be needed to assess pre-determined locations of the river under various flow scenarios. Only an evaluation of flow scenarios conducted in situ can effectively determine the best range of flows for fishability/wadability of this reach of river. The Licensee should coordinate with MDIFW, area guides, local anglers, Trout Unlimited, and other interested parties to ensure a representative collection of anglers are present during the multi-day assessment.

**New (Re-requested) Study Request 5: Landlocked Salmon Habitat Use/Spawning Study—Penobscot Mills Project**

1. This study will document the seasonal movement of landlocked salmon in the North Twin Impoundment area (includes Ambajejus, Pemadumcook, North Twin, South Twin, and Elbow Lakes) as well as identify salmon spawning areas.

Objectives:

- Identify landlocked salmon spawning areas within the North Twin Impoundment, and determine effects of Project drawdowns on spawning
- Determine the effects of annual Project drawdowns on the movement and behaviors of landlocked salmon in the impoundment
- Track seasonal movements and behaviors of landlocked salmon (within and between the five connected lakes) via radiotelemetry
- Assess tributary access and conduct tributary redd counts utilizing information obtained from tagged salmon movements
- Collection of biometric data to characterize landlocked salmon population dynamics

This study is being re-requested by MDIFW because the 2022 North Twin Impoundment Tributary Access Survey Study, as designed, is unable to document whether landlocked salmon spawning is occurring in the drawdown zone of North Twin Lake. Moreover, currently data is lacking documenting the exact locations of spawning for landlocked salmon at the North Twin Impoundment area. It is conventional thought salmon use larger tributaries of North Twin for spawning, particularly Nahmakanta

Stream (Pemadumcook Lake) and the West Branch Penobscot River (Ambajejus Lake inlet). However, the North Twin Impoundment is nearly 18,000 acres with numerous smaller tributaries in the impoundment which contain documented spawning habitat, yet it is unknown if salmon have the ability to access these tributaries for spawning.

2. MDIFW is the State Agency responsible for managing the inland fishery resources in Maine. The lakes within the North Twin Impoundment are managed primarily for brook trout, landlocked salmon, lake trout, and rainbow smelt. Populations of these species are maintained through a combination of annual stocking (brook trout), semi-annual stocking (lake trout), and natural reproduction (landlocked salmon).

3. MDIFW is a cabinet level agency of the State of Maine. Under Maine State Law (12 MRSA, §10051), MDIFW's mandate is *"…to preserve, protect, and enhance the inland fisheries and wildlife resources of the State; to encourage the wise use of these resources; to ensure coordinated planning for the future use and preservation of these resources; and to provide for effective management of these resources."*

4. The North Twin Development operates as a store-and-release facility. From August 22 to October 15, the impoundment is maintained above elevation 488.42 feet (within 3.5 feet from normal full pond elevation). From October 15 to the start of the freshet, the impoundment elevation is gradually reduced to a lower target elevation of 479.42 (12 feet from normal full pond elevation) to provide storage for winter thaw and spring flows. MDIFW is not aware of any previous studies or data summaries focused on landlocked salmon movement and spawning habitat/tributary use as related to the North Twin Impoundment in particular, nor the Penobscot Mills Project in general. This information would be invaluable to the Department's efforts of managing a (in recent years) naturally reproducing population of landlocked salmon to maintain a quality fishery in the nearly 18,000-acre North Twin Impoundment.

5. Landlocked salmon were historically stocked periodically in the North Twin Impoundment by MDIFW for 17 of the 36 years between 1937 and 1973, then annually from 1976 to 2010, and 2014-2017. A continuously decreasing number of salmon were stocked during the 2014-2017 timeframe. Stocking of landlocked salmon ended in 2017 after MDIFW gill net surveys at the time indicated a large percentage of captured salmon were of naturally reared origin. Presently, landlocked salmon in the North Twin Impoundment consist of a self-sustaining naturally reproducing population relying on adequate and accessible spawning habitats. The Department is continuously striving to improve the salmon fishery to a healthy balance, and with that maintain an equally healthy population of rainbow smelt, the primary prey species of landlocked salmon. As outlined in the PAD, under the current operating license issued in 1996, Article 408 required the Licensee to maintain the North Twin Impoundment at a minimum target level of 488.42 feet for the period August 22 through October 15 to accommodate lake trout spawning and incubation in October. However, after periodic lake trout monitoring during the early 2000's, it was determined wild lake trout reproduction was not occurring in the impoundment. Therefore, Article 408 was amended in 2012 to remove the minimum target lake elevation level during the period August 22 through October 15. With the minimum target lake elevation now removed, MDIFW believes that the Project's seasonal drawdown cycles could have a negative impact on landlocked salmon spawning and incubation within the impoundment and its tributaries. This study will also assist MDIFW on how best to manage the fishery and determine if significant lake level drawdowns are impacting salmon life movement, foraging, or spawning within the shoreline or movement up tributaries within the Project.

6. Radiotelemetry studies are routinely requested and utilized during the hydro relicensing process in Maine and elsewhere. Similar radiotelemetry studies have been proven essential to developing management plans for the Rapid River and West Branch fisheries, and similar studies at Moosehead Lake

above the East Outlet Dam (FERC No. P-2671), Brassua Lake above the Brassua Dam (FERC No. P-2615), and in the Kennebec River downstream of Indian Pond Project (FERC No. P-2142) have been completed in recent years. The proposed study may be similar to other projects occurring at other hydroelectric projects but should include a sample size large enough to fully assess all movements including regular tracking events. Radiotelemetry is a highly effective means of determining salmonid movement and habits and determining potential Project-related impacts to their populations.

7. This study is commensurate with the scale of the Project, presumed new 40-year operating license, and the importance of the resource. The level of effort and cost, to include multi-season sampling, is consistent with an impoundment of this magnitude. MDIFW needs a better understanding of the movement and spawning of naturally reared landlocked salmon fisheries in the North Twin Impoundment and how the Project may or may not be impacting these fisheries to achieve MDIFW management goals.

The natural resources and other concerns associated with these Projects are very complex, and we appreciate the Licensee's ongoing commitment to work through these issues. Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,



John Perry
Environmental Review Coordinator

Cc: Francis Brautigam, Joe Overlock—MDIFW Fisheries Division, Augusta Headquarters
Tim Obrey, Jeff Bagley—MDIFW Fisheries Division, Region E
Kevin Dunham, Kevin Gallant—MDIFW Fisheries Division, Region F
Nathan Webb, Ryan Robicheau—MDIFW Wildlife Division, Augusta Headquarters
Danielle D'Auria, Shevenell Webb, Derek Yorks, Beth Swartz, Phillip deMaynadier—MDIFW Wildlife Research and Assessment Section
Doug Kane, Scott McLellan—MDIFW Wildlife Division, Region E
Mark Caron, Lauren McPherson—MDIFW Wildlife Division, Region F
Casey Clark, MDMR
Kyle Olcott, Laura Paye—MDEP
Jim Vogel, BPL
Julianne Rosset, USFWS
Jeff Murphy, NMFS

Kimberly D. Bose July 4, 2023
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426 Via Electronic Filing

Penobscot Mills Hydroelectric Project (FERC No. 2458 RE: Comments on the initial Study Report and Support of Maine Department of Inland Fisheries and Wildlife's Request to Radio Tag North Twin Impoundment Landlocked Salmon

In the June 30, 2023 filing The Maine Department of Inland Fisheries and Wildlife (MeDIFW) commented on Initial Study Report (ISR) North Twin Impoundment Tributary Access Survey Study results. MeDIFW stated "Licensee modified the original proposal and removed the radio tagging portion of the study which would have indicated habitat use of landlocked salmon within the Project area". The results provided by the ISR failed to provide new information.

That Landlocked salmon (salmon) spawn in Nahmakanta Stream has been known for over fifty years. Possible barriers to spawning areas were surveyed in the late 1980s and included in Great Northern Paper's 1991 Application. While salmon redds were observed by the 2022 study team, the origin of these fish is unproven as is the delays or difficulties these fish may have encountered as they left the impoundment. The ISR mistakenly assumes the salmon and redds observed in Nahmakanta Stream originated in North Twin Impoundment. Redds observed in Nahmakanta Stream could easily been from upstream stocks e.g. Nahmakanta or Joe Mary Lake or strays from the West Branch of the Penobscot River.

Any valid tributary access study must include salmon caught and radio tagged in one of the North Twin Impoundment's basins. Salmon captured in September would be followed until the completion of spawning by mid-November. In as much as North Twin salmon

historically spawned in the West Branch, at a minimum a data logger should be located at the Grant Brook Bridge. Known spawning areas below Abol Bridge and Pockwockamus Falls should be included on a time available basis.

In order to account for straying, I suggest that 20 adult fish each from South Twin, Ambajejus, and Pemadumcook basin radio tagged. Trap net fish can be held in holding pens until tagging. Fish should be released at predetermined sites in each of the three basin. Under high attraction flows, salmon have been known to move to spawning areas as early as August. Thus, rain events need to be taken into account.

If the tributary study is to have any validity, radio tagging must be part of the study. Present study results found in the ISR provide no useful information. I ask FERC to order radio tagging of North Twin Impoundment salmon.

Thank you for the opportunity to comment

Contact information
Ed Spear
307 Mt Hope Ave
Bangor, Me 04401
Phone: 207-217-4288

UNITED STATES OF AMERICA

FEDERAL ENERGY REGULATORY COMMISSION

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|---|---|
| Great Lakes Hydro America, LLC<br>Application for New License | Ripogenus Hydroelectric Project<br>FERC No. 2572<br><br>Penobscot Mills Hydroelectric Project<br>FERC No. 2458 |

AMERICAN WHITEWATER AND APPALACHIAN MOUNTAIN CLUB COMMENTS ON INITIAL STUDY REPORT AND REQUEST FOR FURTHER STUDY FOR THE RIPOGENUS HYDROELECTRIC PROJECT (P- 2572) AND PENOBSCOT MILLS HYDROELECTRIC PROJECT (P-2458)

American Whitewater and Appalachian Mountain Club ("AW/AMC") submit the following comments and requests for additional study pursuant to 18 CFR section 5.15, in response to the April 23, 2023 filing of the Initial Study Report (ISR) for the Ripogenus Hydroelectric Project and Penobscot Mills Hydroelectric Project (FERC Project Nos. P-2572, P-2458) by Great Lakes Hydro America, LLC ("GLHA"). The licensee held an in-person ISR meeting in Millinocket, Maine in which it provided information on the status of the 20 studies required by FERC's May 13, 2022 Study Plan Determination ("SPD").

## Summary and Requests for Additional Study

On October 8, 2021, AW/AMC filed extensive comments on the pre-application and scoping document, as well as submitting three study requests, to collect information needed to develop an understanding of project operations and their impacts on resources to inform the proceedings and compliance with the National Environmental Policy Act. Specifically, AW/AMC requested the applicant complete the following studies: (1) Recreation Facility Inventory, Recreation Use and Needs Assessment, Aesthetics and Reservoir Surface Area Assessment Study; (2) Controlled-flow Whitewater Boating and Access Study; and, an (3) Aesthetics Resources Study. In the Study Plan Determination (SPD), FERC adopted with modifications the study requests of AW/AMC.

In response to the ISR, AW/AMC requests that the applicant address study deficiencies, complete studies not completed in accordance with the Study Plan Determination (SPD), and continue studies where additional information is needed to inform the proceeding. Related to the three studies requested and adopted by FERC with modification, AW/AMC submit the following requests.

1) Pursuant to 18 CFR section 5.15 (d)(1), AW/AMC, request that the applicant complete the Recreation Study consistent with the methodology recommended by FERC in the

SPD. Though the applicant completed a site inventory and condition assessment of formal recreation sites, the SPD clearly states that the methodology must include "provisions for interviews or focus groups with interested individuals representing recreation user groups (e.g. whitewater boaters, anglers), commercial outfitters, and campground owner/operators." The applicant fails to describe any such interviews in the report and fails to note this variance from the approved study plan in the ISR.

As such, it is necessary for the applicant to complete the study in accordance with SPD pursuant to 18 CFR section 5.15 (d)(1), "*Approved studies were not conducted as provided for in the approved study plan.*" Additional comments and inadequacies of the Recreation Study as filed in the ISR are provided herein.

2) Pursuant to 18 CFR section 5.15 (d) & (e), AW/AMC request that the applicant continue to study whitewater boating consistent with the Whittaker Level 2 and 3 methodology, as the Whitewater Boating Assessment has not answered important questions posed in the SPD, specifically the "relationship between stream flow and recreational boating opportunities for a variety of watercraft". The Whitewater Boating Study does not sufficiently identify suitable boatable flow ranges for the West Branch Upper Gorge below Ripogenus Dam and the West Branch below Stone Dam. The applicant notes in the report for the Upper Gorge, for example, that "Flow information is not publicly available for this reach," therefore the report's Suitable Boatable Flow Range can only be accurately determined by a Level 2 and Level 3 Whittaker assessment of on-land and on-water controlled flow studies. The Stone Dam reach, identified as having a Suitable Boatable Flow Range of 700-5,000 cfs, has no publicly available flow information and only two paddlers and one video were referenced in developing the report. The applicant notes in the report that releases from Stone Dam are "typically made by deflating the inflatable dam," which seems to provide an opportunity for water to be made available for paddlers.

   AW/AMC requests that FERC require the applicant to proceed to a Whittaker Level 2 and Level 3 study specifically for the Upper Gorge below Ripogenus Dam and the West Branch Below Stone Dam. Insufficient information was collected during the Level 1 study. The methodology dictates that additional study is needed if a Level 1 study cannot affirmatively answer the question, "Does Level 1 information precisely define flow ranges and potential project effects for each flow-dependent opportunity?" (Whittaker, page 13). Without an accurate understanding of flow ranges and flow preferences for paddling these reaches, additional information is needed to inform the National Environmental Policy Act process.

   In the SPD, FERC specifically notes that "The need for a Level 2 or Level 3 study would be addressed after the first study season. Following the ISR meeting, stakeholders can propose to modify the study plan, or propose new information gathering or studies [sections 5.15(d) and 5.15(e)]." Lacking clarity on whether this request falls under

5.15(d) or 5.15(e), AW/AMC respond to the requirement of 5.15(e), and provide the following responses.

*(1) Any material changes in the law or regulations applicable to the information request;*

There have been no material changes in the law or regulations, though the applicant failed to collect sufficient information to complete a Whittaker Level 1 study.

*(2) Why the goals and objectives of any approved study could not be met with the approved study methodology;*

The study goals and objectives have not been fully answered by the ISR. Specifically, the study fails to achieve the study goals to: "assess the … useability of the four study reaches"; "to identify a range or flows that provide opportunities for whitewater paddlers…"; and "assess the acceptable paddling flows under current and proposed Project operations". These study goals have not been accomplished by the ISR.

*(3) Why the request was not made earlier;*

AW/AMC requested the use of the Whittaker methodology in our study plan request, which defines a stepwise approach to studying whitewater, such that a Level 2 or Level 3 study would be conducted if a Level 1 study cannot adequately inform the proceeding. FERC adopted only a Level 1 study, while articulating in the SPD that a Level 2 or Level 3 would be considered if warranted after the filing of the ISR. AW/AMC request the continued application of the Whittaker methodology by proceeding to Level 2 and Level 3 for the Upper Gorge below Ripogenus Dam and the Stone Dam reach, which is both warranted and necessary to inform this proceeding and consistent with our initial study plan request.

*(4) Significant changes in the project proposal or that significant new information material to the study objectives has become available; and*

The Level 1 study demonstrated that the Upper Gorge and Stone Dam reaches contain would provide significant whitewater boating opportunities if sufficient flow, access, and flow information was provided. New information must be collected to achieve the study goals objectives. Information specific to flow preferences of paddlers is lacking, warranting further study beyond the collection of existing information in the Whittaker Level 1 study.

*(5) Why the new study request satisfies the study criteria in § 5.9(b).*

AW/AMC refer to our October 8, 2021 filing of PAD comments and study request, wherein these questions were answered in detail. To further clarify, AW/AMC reiterate that study goals and objectives outlined in our study request and as adopted in the SPD have not been answered by the ISR. Specifically, the study fails to achieve the study goals to: "assess the … useability of the four study reaches"; "to identify a range or flows that provide opportunities for whitewater paddlers…"; and "assess the acceptable paddling flows under current and proposed Project operations". These study goals have not been accomplished by the ISR. The use of existing information is insufficient to meet these study goals.

3) Pursuant to 18 CFR section 5.15 (d)(1), AW/AMC, request that the applicant complete the Aesthetic Study consistent with the methodology recommended by FERC in the SPD. Though the applicant collected data to partially inform a baseline documentation of the scenic views, vistas, riverscapes, and other noteworthy features of the projects, the applicant failed to conduct the study "in consultation with Maine BPL, AW/ATC (sic), the Camp Owners Associations, and other interested stakeholders". AW/AMC specifically requested consultation in our study request and FERC recommended the engagement of stakeholder groups in the SPD, which did not occur in development of the Aesthetics Study.

   As such, it is necessary for the applicant to complete the study in accordance with SPD pursuant to 18 CFR section 5.15 (d)(1), "*Approved studies were not conducted as provided for in the approved study plan.*" Additional comments and inadequacies of the Aesthetics Study are provided herein. AW/AMC note that the SPD specifies consultation with "AW/ATC" though we believe this intended to be "AW/AMC".

## Comments on the Initial Study Report

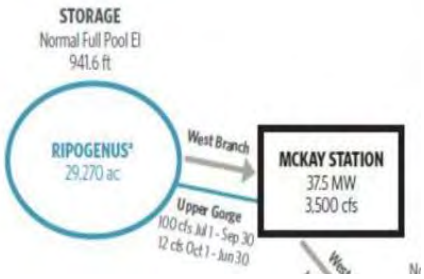
1. Historic Operations Data Assessment Study

The Ripogenus and Penobscot Mills hydroelectric projects were last licensed in 1996. At the time of the last relicensing, the project provided power to the Millinocket and East Millinocket paper mills. Those paper mills closed in 2008 and 2013, respectively, and the projects were converted to provide power to the electric grid in 2014. Although the project purpose changed in 2014 following the closure of the paper mills, the Water Management Plan, including the required minimum flows to the West Branch Penobscot bypassed reaches and Millinocket Stream, is based on the project purpose of supplying power to the paper mills at the time of the last relicensing. The study does not address historical changes in the timing of generation since the closure of the paper mills and the repurposing of the project,

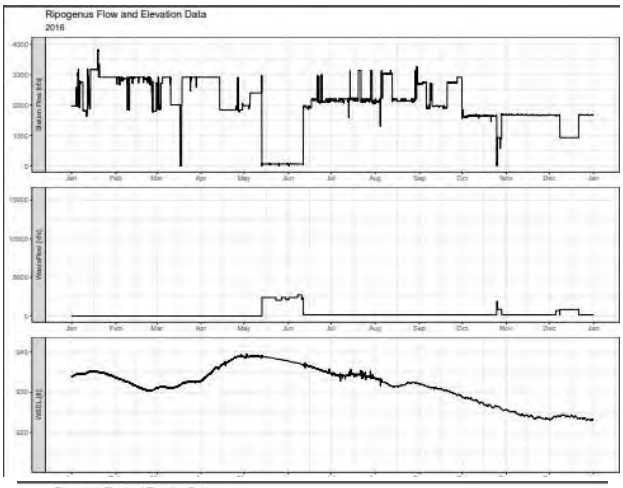
The licensee's Historic Operations Data Assessment Study includes a system diagram of the Ripogenus and Penobscot Mills projects that identifies project facilities and flow

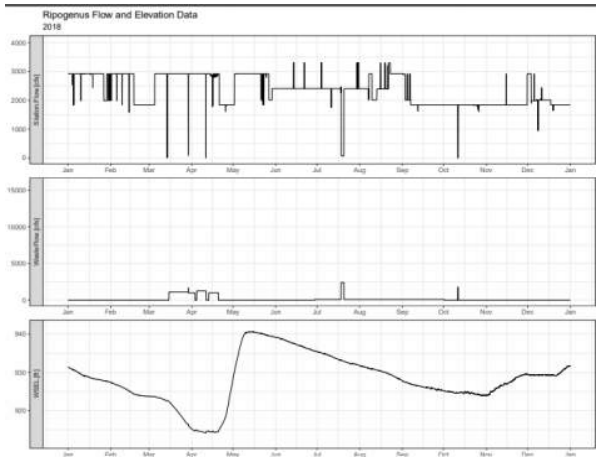
requirements under the current license. The study also summarizes river hydrology and the effects of project operations on impoundments and downstream flows over a 20-year period. Providing aggregate information is of limited use in understanding the effects of project operations, and stakeholders requested that the licensee provide the raw data in Excel format so that stakeholders can provide meaningful comments on the study report. On May 22, 2023, the licensee filed the raw data along with its ISR meeting summary. While the licensee provided hourly flow data, 15-minute interval data is typically provided for USGS gage data and would allow for a more granular analysis that would be useful in evaluating the project impact on other resources. Given the volume of data and the short time allowed for commenting on the ISR according to FERC's relicensing schedule, we reserve the right to provide additional comments on this study once we are able to complete a more in-depth review of the data.

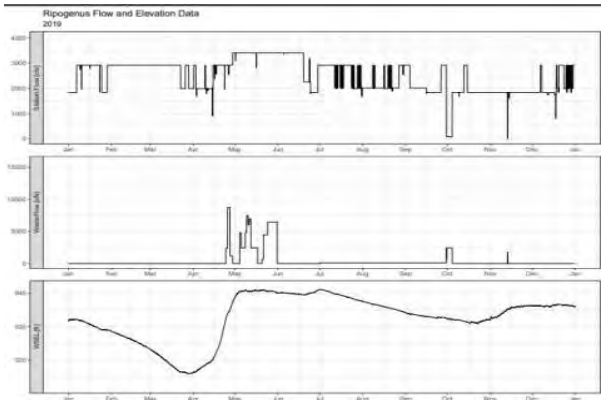
While the system diagram is complex, it's helpful to view the project components separately to better understand the effect of project operations on aquatic and recreation resources. The Ripogenus Dam impounds the West Branch creating a 710,000 acre-foot impoundment that fluctuates by 44 feet and causing negative impacts to Ripogenus Lake, Caribou Lake, Chesuncook Lake, Moose Pond, Brandy Pond, and Black Pond. Project operations at Ripogenus divert flows into a penstock bypassing the natural river channel, leaving .75 miles of the West Branch dewatered except for an unnatural minimum flow of 12-100 cfs when flows are less than the 3500 cfs hydraulic capacity of McKay Station. Under its current license, the licensee is required to release minimum flows at McKay Station ranging from 1000-2300 cfs at different times of day and at different times of year that support power generation, aquatic habitat below McKay Station, and whitewater boating and other recreation.




Project operations at McKay alter flows by impounding and gradually releasing flows on the West Branch. Project operations at McKay adversely affect water quality by raising water temperature and lowering dissolved oxygen in the impounded lakes, reducing sediment transport, harming the littoral zone, and limiting stream access upstream from the dam. Downstream from the dam, the natural river channel between Ripogenus Dam and McKay Station is adversely affected by the inadequate minimum flow and by the loss of naturally variable flows that have an adverse effect on aquatic habitat and whitewater boating use in the Upper Gorge. An examination of historical flow data demonstrates the infrequency of spill below Ripogenus Dam when the impoundment is full and inflows exceed the 3,500 cfs McKay Station hydraulic capacity. Fig. 1, below, shows total spill below McKay Station during low (2016), average (2018), and high (2019) water years.



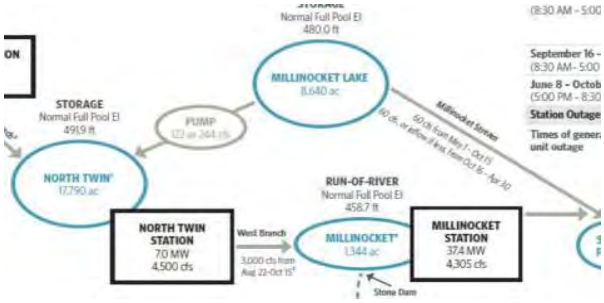



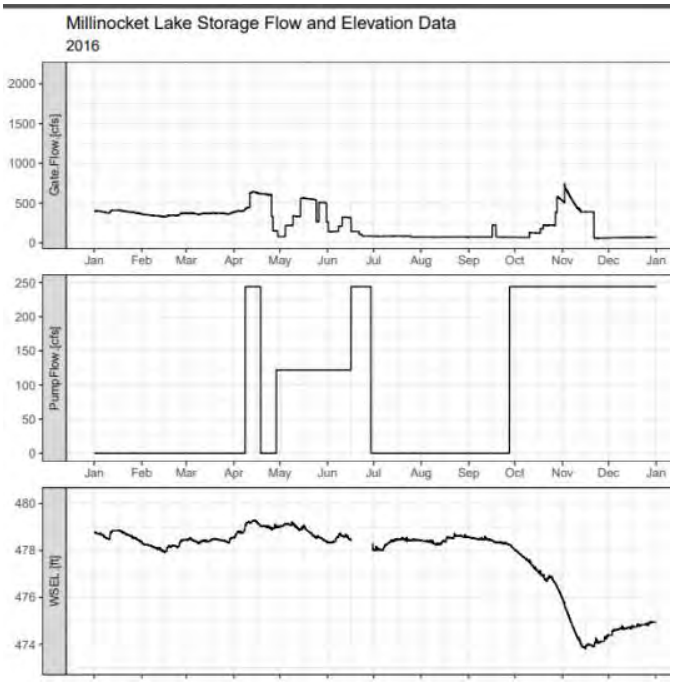

The above tables show that spill below Ripogenus Dam is infrequent even during even the highest water years and is generally limited to the high flows that typically occur at tail end of the spring freshet when the impoundment fills after the annual winter drawdown. The licensee manages the project to maximize generation by lowering the reservoir elevation during the winter to avoid spill — what the study report euphemistically and offensively calls “waste flow”, but which are actually the restored natural flows to the West Branch of the Penobscot River. This

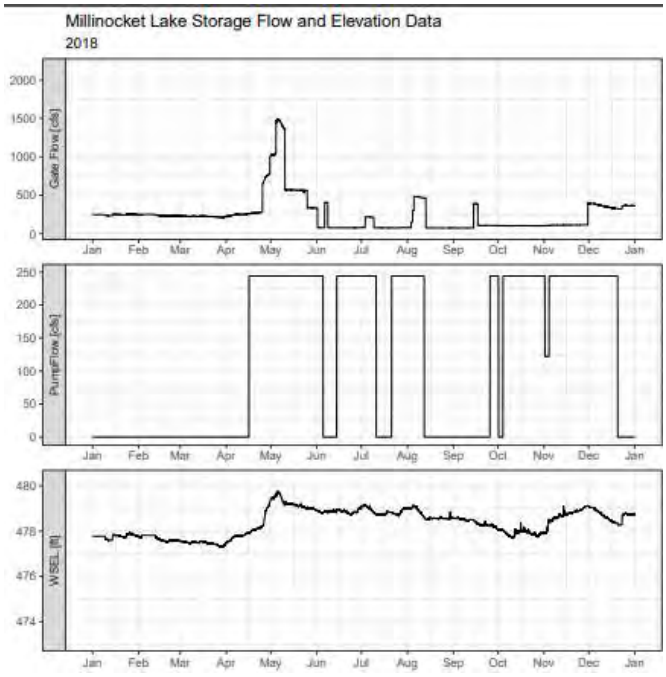
artificial lowering of the impoundment reduces the number of boatable days in the Upper Gorge and beneficial effects of high flows on aquatic habitat.

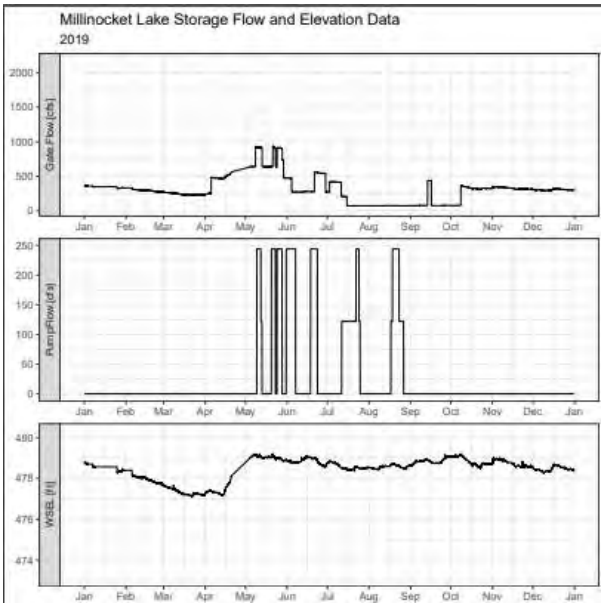
Below Ripogenus, the Penobscot Mills Project is a bit more complex, but can be better understood by breaking down the flow management into several core components. Millinocket Lake Storage serves as one of several impoundments for the Millinocket Development with a fluctuating impoundment affecting upstream and downstream aquatic habitat. Flows on Millinocket Stream are diverted by Millinocket Lake Dam and then pumped to Ambajejus Lake joining inflows from the Ripogenus Project into North Twin. The pumping station was constructed in 1950 to provide additional water for generation of power for the paper mills. With the demise of the paper mills, the flow diversion and partial dewatering of Millinocket Stream provides power to the grid and profit to the licensee. Lake Millinocket and Millinocket Station essentially function similar to Ripogenus in that flows are diverted by Millinocket Lake Dam through a series of impoundments before flowing into the Millinocket Station tailrace and back into Millinocket Stream.



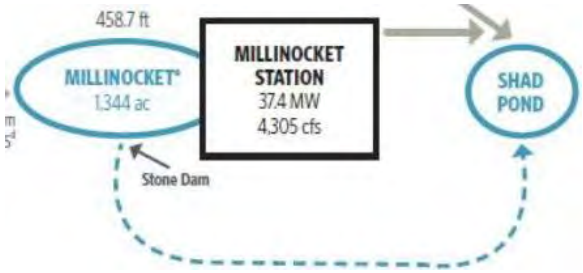

The effect of this diversion is the partial dewatering of Millinocket Stream leaving only a minimum flow of 60 cfs or less to support aquatic habitat. The flow diversion at Millinocket Dam disrupts river connectivity due to the lack of fish passage, obstructs sediment transport and water quality, and reduces flow variability. The licensee operates two pumps with a combined hydraulic capacity of 244 cfs to pump water from Millinocket Lake to Ambajejus Lake. The pumps typically operate from 16-63 percent of the time throughout the year, with near continuous pumping typically occurring throughout much of the warmer summer months in all water year types, often reducing outflows from 300 cfs down to a meager 60 cfs for much of the year. Since there is no gage on Millinocket Stream, the flow data is based on a calculated flow, so the accuracy of this data cannot be verified.


Millinocket Lake Storage Flow and Elevation Data
2016
Gate Flow [cfs]
2000
1500
1000
500
0
Pump Flow [cfs]
250
200
150
100
50
0
WSEL [ft]
480
478
476
474
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan


Millinocket Lake Storage Flow and Elevation Data
2018
Gate Flow [cfs]
2000
1500
1000
500
0
Pump Flow [cfs]
250
200
150
100
50
0
WSEL [ft]
480
478
476
474
Jan
Feb
Mar
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May
Jun
Jul
Aug
Sep
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Nov
Dec
Jan

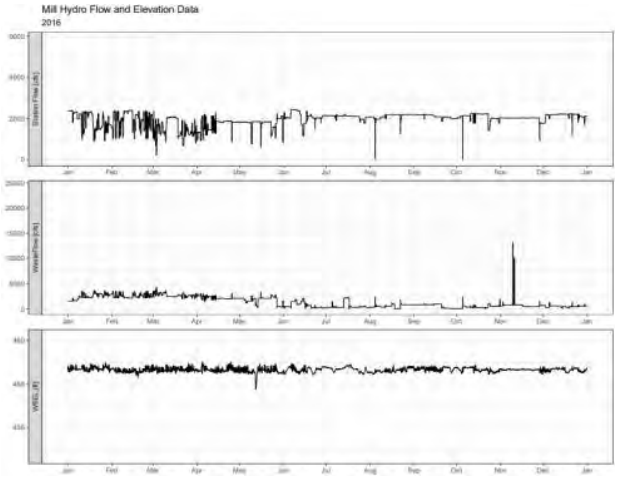


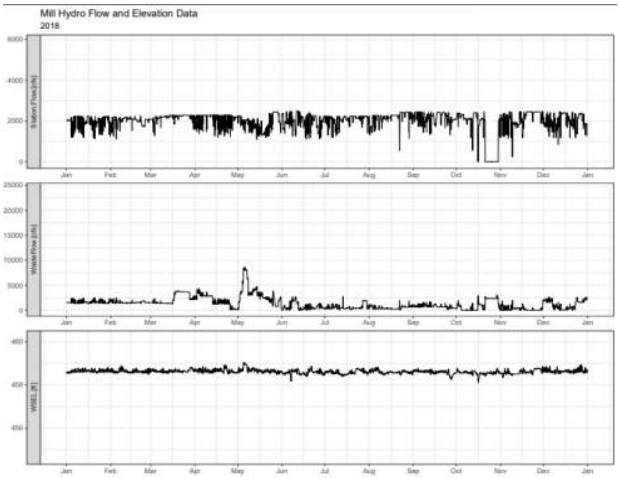

The Millinocket Development also functions as a typical hydropower project with Stone Dam impounding the West Branch of the Penobscot River, a bypassed reach on the West Branch of the Penobscot River below Stone Dam, and a powerhouse at Millinocket Station discharging diverted flows into Shad Pond before rejoining the West Branch at Shad Pond. Under the current FERC license, the bypassed reach of the West Branch has been completely dewatered by the Stone Dam other than minimal leakage or infrequent spillage over the flashboards.

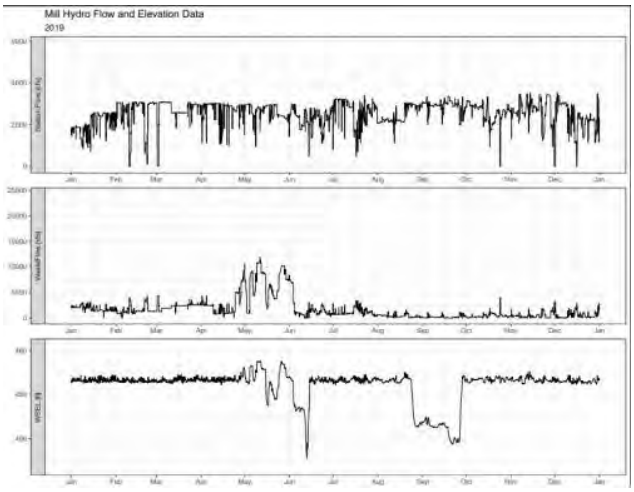



The 1996 FERC license disregarded the environmental consequences of the complete dewatering of the West Branch below Stone Dam based on the economic impact to the paper mills owned by the then licensee, Great Northern Paper. The dewatering of the West Branch below Stone Dam can no longer be justified by the economic impact on Great Northern Paper whose paper mills no longer operate, their crumbling structures marring what would otherwise be a pristine landscape. The dewatering below Stone Dam has disrupted river connectivity, destroyed aquatic habitat, eliminated recreation opportunities, and degraded cultural resources.

Data provided by the licensee in the ISR as well as its subsequently filed Excel file for the Millinocket Station development is either inconsistent with the manner in which the licensee operates the project or is otherwise unreliable.




If accurate, the data shows that the licensee has the capacity to release a full range of flows below Stone Dam notwithstanding its supposed lack of physical ability to do so due to its installation of a bladder gate that blocked access to its operable gates at Stone Dam. The data

graphs, above, depict that the licensee generated variable flows at Millinocket Station while never operating the station at capacity during the three water years shown. At the same time, the graphs show that the licensee maintained a generally stable impoundment and continuously spilled variable flows below Stone Dam. Since the licensee lacks a flow gage at the project and calculated virtual flows based on impoundment level and Millinocket Station generation, the data provided by the licensee appears to be unreliable. The licensee should explain in its response to these comments whether the data provided in this study accurately reflects the flow below Stone Dam, and if so, the reasons for and the means by which it released the flows shown. To the extent that the licensee's data is inaccurate, it should explain the extent to which it relied on this data in the development of the operations model.

2. Operations Model Study

The licensee developed an operations model to simulate both current operations and the impact of alternative modes of operation on generation, reservoir levels, and outflows. The model inputs also included reference gages that simulate project inflows and selected the Seboeis gage (USGS-01029200) and the best reference gage. The Seboeis gage, once adjusted for the drainage area, is useful for evaluating the extent to which the project alters the natural flow regime and causes adverse impacts to aquatic habitat, recreation, and other non-developmental resources. Additionally, the licensee utilized the model to create a baseline against which alternative operating scenarios will be evaluated. While the study endeavors to verify the accuracy of the model against historic operations data, the model results often vary considerably from historic operations.

The licensee elected to utilize the CHEOPS operations model rather than an open-source model such as HEC-RAS that would have provided greater transparency and opportunities for stakeholders to "turn the knobs" on the model to better understand the effect of different scenarios, meaningfully participate in the relicensing process, and better inform FERC's NEPA analysis. Both American Whitewater and FERC raised this concern at the ISR meeting, and FERC appropriately encouraged stakeholders to submit alternative operating scenarios for evaluation utilizing the operations model.

AW/AMC request operations model runs for a variety of scenarios related specifically to flows released from the following locations: 1) Ripogenus Dam; 2) Millinocket Lake Dam; and, 3) Stone Dam. River ecology and recreation on the West Branch of the Penobscot River watershed has been significantly impacted by the projects. The models proposed by our organizations seek to mitigate for the impacts of the projects on our interests and would benefit recreational users.

At the Upper Gorge, whitewater paddlers primarily seek Operations Model Runs that would evaluate the effect of providing scheduled whitewater boating opportunities in the Upper Gorge and increase minimum flows. While the acceptable and optimal whitewater boating flows in the Upper Gorge are not well understood, we request a model run evaluating the effects of providing weekly paddling opportunities in the Upper Gorge during the boating season at a flow

of 1,000 cfs. Additionally, we request that the licensee model a 400 cfs minimum flow in the Upper Gorge. This flow would better support aquatic habitat than the current 100/12 cfs minimum flow. The flow would also ameliorate fish stranding downstream of McKay Station when combined with the estimated 500 cfs released during station outages from McKay, a concern raised by Trout Unlimited. These operations model runs will help inform the relicensing, but should not be considered an exhaustive list or a mitigation proposal.

At Lake Millinocket, we have requested two scenarios that would benefit downstream flows and recreation on Millinocket Stream. Ending pumping operations from Millinocket Lake to Lake Ambajejus for generation at Millinocket Development would restore the natural flow regime to Millinocket Stream benefitting aquatic habitat and supporting recreational boating when sufficient natural flows are present. The current 60 cfs steady state flow release eliminates all natural flow variability. Inasmuch as the flow diversion was based on the power needs of the paper mills, restoring Millinocket Stream to its natural state should be modeled. Additionally, providing weekly scheduled releases of 600 cfs during the boating season would support the demonstrated interest in recreational boating on Millinocket Stream.

Below Stone Dam, the requested operations model runs would provide weekly scheduled whitewater boating opportunities as well as a minimum flow that would support aquatic habitat and a cold-water recreational fishery. While additional study is needed on this river reach, a modeled flow of 2300 cfs would match the whitewater flow releases at McKay Station and would pass these same flows through the West Branch below Stone Dam. Additionally, the licensee should model a 400 cfs minimum flow on the West Branch below Stone Dam to provide sufficient wetted width and WUA as supported by the instream flow study.

American Whitewater and Appalachian Mountain Club submit the following operations model runs:

**Model Run #1**
**Upper Gorge Bypassed Reach Minimum Flow**

This model seeks to increase the minimum flow on the West Branch below Ripogenus Dam

| | Dates | Flow (cfs) released from Development | Remarks | Start Hour | End Hour |
|---|---|---|---|---|---|
| Current | 7/1-9/30<br>10/1-6/30 | 100 cfs<br>None (12 cfs) | Provide 100 cfs bypassed reach flow below Ripogenus Dam from sluiceway or other gate from 7/1-9/30 reduced to 12 cfs from 10/1-6/30 | 24 hours | - |
| Alternative | Year Round | 400 cfs | Provide continuous minimum flow of 400 cfs in bypassed reach below Ripogenus Dam to support aquatic habitat and recreation. Minimum flow would also augment flow in the event McKay Station outage, reducing stranding downstream | 24 hours | |

**Model Run #2**
**Upper Gorge Bypassed Reach Whitewater Releases**

This model run seeks to provide opportunities for scheduled whitewater releases in the Upper Gorge below Ripogenus Dam

| | Dates | Flow (cfs) released from Development | Remarks | Start Hour | End Hour |
|---|---|---|---|---|---|
| Current | None | None | No scheduled whitewater releases are currently required in the Upper Gorge | - | - |
| Alternative | 5/1-10/1 | 1000 cfs | Provide flow of 1000 cfs in the Upper Gorge below Ripogenus Dam for 4 hours one weekend day each week to support whitewater boating in the Upper Gorge and below McKay Station. Flow below McKay Station would remain unchanged from current license requirements. | 1000 | 1400 |

**Model Run #3**
**Millinocket Stream Flow Restoration**

This model run seeks to eliminate pumping from Millinocket Lake to North Twin.

| | Dates | Flow (cfs) released from Development | Remarks | Start Hour | End Hour |
|---|---|---|---|---|---|
| Current | Year Round | 60 cfs or inflow if less | Millinocket Stream inflows are pumped from Millinocket Lake to Ambajejus Lake by two pumps with a combined hydraulic capacity of 244 cfs..Millinocket Lake levels fluctuate 6.2 feet. | 24 hours | 24 hours |
| Alternative | Year Round | All inflow | Restore flows to Millinocket Stream by discharging all inflow from Millinocket Lake Dam, stabilizing lake levels and restoring natural flow regime. | 24 hours | 24 hours |

**Model Run #4**
**Millinocket Stream Whitewater Releases**

This model run seeks to provide opportunities for scheduled whitewater releases in Millinocket Stream

| | Dates | Flow (cfs) released from Development | Remarks | Start Hour | End Hour |
|---|---|---|---|---|---|
| Current | None | None | No scheduled whitewater releases are currently required from Millinocket Lake Dam into Millinocket Stream | - | - |
| Alternative | 6/1-10/1 | 600 cfs | Provide flow of 600 cfs from Millinocket Lake Dam into Millinocket Stream for 4 hours one weekend day each week to support whitewater boating on Millinocket Stream | 1000 | 1400 |

**Model Run #5**

**West Branch Below Stone Dam Minimum Flow**

This model run seeks to establish a minimum flow for the West Branch below Stone Dam

| | Dates | Flow (cfs) released from Development | Remarks | Start Hour | End Hour |
|---|---|---|---|---|---|
| Current | - | None (3 cfs) | Currently there is no minimum flow requirement on the West Branch below Stone Dam | - | - |
| Alternative | Year Round | 400 cfs | Restore flows to the West Branch below Stone Dam by discharging a continuous minimum flow of 400 cfs through new gate structure or powerhouse to benefit aquatic habitat and recreation | 24 hours | 24 hours |

**Model Run #6**

**West Branch Below Stone Dam Whitewater Releases**

This model run seeks to provide opportunities for scheduled whitewater releases in the West Branch below Stone Dam

| | Dates | Flow (cfs) released from Development | Remarks | Start Hour | End Hour |
|---|---|---|---|---|---|
| Current | None | None | No scheduled whitewater releases are currently required from Stone Dam into the West Branch | - | - |
| Alternative | 5/1-10/1 | 2300 cfs | Provide flow of 2300 cfs from Quakish Lake over Stone Dam for 4 hours one weekend day each week to support whitewater boating on the West Branch below Stone Dam | 1000 | 1400 |

3. Water Quality Study

The Water Quality Study assessed project impacts on water quality in the impoundment and riverine reaches. Regarding the Riverine Aquatic Habitat Assessment of the Upper Gorge, the study failed to achieve the study goal to determine if existing baseline minimum flow conditions provide aquatic habitat that meets MDEP's hydropower guidance.

The study purports to evaluate the reach to determine zone of passage conditions for adult resident fish (e.g., landlocked salmon) at the two seasonal minimum flows. While the study evaluated the minimum depth at its three chosen transect locations, the study did not assess whether the minimum flows provided a continuous zone of passage throughout the Upper Gorge. Given the high gradient in the Upper Gorge and the lack of any minimum flow whatsoever for nine months of the year with the exception of an estimated leakage flow of 3 cfs, the study's conclusion that the flows provide suitable aquatic habitat defies both logic and laws of physics. Instead, for most of the year the reach contains a series of disconnected pools separated by a rocky substrate that fails to provide landlocked salmon with a continuous zone of passage in the Upper Gorge. The USFWS' standard protective ABF recommendation of 0.5 cfs/square mile of drainage area (1422 cfsm) would require a minimum flow of 711 cfs in the Upper Gorge.

The study also fails to adequately address whether the minimum flow provides sufficient wetted width in the Upper Gorge. As noted in the report, the study requested by MDEP was to assess whether the existing minimum flow maintains three-quarter wetted cross-sectional area, as defined in Chapter 581 (5) of MDEP's regulations relating to water quality evaluations. Neither the study's selected transects nor the other methods used by the licensee demonstrate that the existing minimum flow meets this standard,

At Millinocket Stream, the study compared existing minimum flow conditions to the estimated bankfull conditions (% cross sectional area). The results of this study showed that the existing 60 cfs minimum flow release provides approximately 36 to 54 percent of the cross-sectional area of the bankfull channel, demonstrating that the project fails to adequately protect the wetted stream width at Millinocket Stream.

Regarding the reach below Stone Dam to Shad Pond, this section of the Penobscot River has a lowered water classification of Class C due to the complete dewatering of the reach by the licensee other than the backwatering from Shad Pond and the rare spill event. Any suggestion that this dead river reach meets even the reduced classification protective of aquatic life or recreation is nonsensical as this reach contains stagnant and disconnected pools under normal operating conditions. The licensee, appropriately, does not characterize the current dewatered state of the West Branch below Stone Dam as meeting the wetted width or minimum depth criteria. The report provides information on flow levels at its two selected transect locations demonstrating that the current flow is inadequate. Additionally, the zone of passage analysis only models flows up to 100 cfs rather than modeling higher flow levels. The modeling shows that a flow of 100 cfs provides only a narrow zone of passage in these two zones.

4. Instream Flow and Habitat Downstream of Stone Dam Study

This study assessed the adequacy of minimum flows for a cold-water fishery downstream of Stone Dam. Presently, there is no cold-water fishery due to the dewatering of this section of the West Branch by the licensee. The present lack of flows fails to provide adequate wetted width or depth required for adult Brook Trout or Landlocked Salmon according to the study. While different life stages and fish species require different minimum flows, providing a minimum flow of at least 400 cfs would be necessary to maintain three-quarter wetted cross-sectional area or provide a weighted usable area (WUA) of at least 80 percent. The study further found that maximum suitable habitat for adult Brook Trout and macroinvertebrates requires a minimum flow of 700 cfs.

The study reanalyzes data from the 1987 IFIM conducted at the time of the last relicensing. The IFIM evaluated flows of 420 and 700 cfs releases from a 52-foot-wide mechanically operated log sluice atop the center section of Stone Dam. Since that time, the licensee installed a 428-foot wide, 2-foot 9-inch-high Bridgestone rubber inflatable dam on the river left section of the dam. The licensee states in the PAD the following:

> Air is supplied to the rubber dam for inflation through a fitting in the abutment of the dam that is connected to two high capacity air blowers. Inflation or deflation of the rubber dam may be done in one of two modes: Manual or Automatic. Remote monitoring and control from Brookfield's National System Control Center (NSCC) is the normal mode of operation. Instead of gate operation, the NSCC operator remotely inflates or deflates the rubber dam to pass the appropriate flows. Flows from the dam enter the 4.5-mile-long Back Channel before flowing into Shad Pond.

It is unclear when FERC amended the license or when the licensee installed the rubber inflatable dam. The licensee asserts that the installation of the inflatable dam prevents access to the mechanical gate structure in the center section that previously allowed it to provide a controlled flow release from Stone Dam. While the licensee claims that it is now unable to provide controlled flow releases from Stone Dam due to the installation of the rubber inflatable dam, that does not appear to be correct. With an upstream monitoring system detecting varying water levels, the automatic control system adjusts the air pressure in the dam to maintain the desired water level. In any event, the licensee knew or should have known that it would be required to restore flows to the West Branch below Stone Dam in the upcoming relicensing and should have maintained the ability to do so either using current or new gate structures. To the extent that the licensee's own modifications limited its ability to control flows, that limitation is of its own doing and should be addressed in this relicensing.

5. Recreation Study

The licensee's Recreation Study fails to provide FERC with sufficient information to evaluate project impacts on recreation opportunities in the project boundary and in areas affected by project operations. By limiting the geographic scope of the study to FERC-approved

recreation sites, the study omits informal recreation sites that provide in some cases the only river access to waters in the project boundary or are otherwise necessary to engage in recreational activities in the project area.

In the Upper Gorge, the study fails to address the adequacy of trails leading to the water below Ripogenus Dam that is used by boaters and anglers. The path down to the river is unmarked and difficult to discern, very steep, overgrown, and loose posing a safety risk especially for those shouldering a whitewater kayak. At Millinocket Stream, the access is unmarked, there is inadequate parking, and difficult river access. At Stone Dam, there is no clearly marked parking area across Quakish Lake, there is no easy egress at Stone Dam, and no land access to Stone Dam is provided. These areas are all used during spill events when flows are restored to these river reaches; however, the difficult access and lack of real-time flow information inhibit recreational use. To assess project effects on this recreation opportunity, the licensee needs to expand the geographic scope of the study to include informal recreation access areas identified by stakeholders.

While the study purports to assess recreation facilities, access, and use at formal recreation areas, the study is deficient in several important respects. Comments by stakeholders at the ISR meeting raised concerns about the McKay Station river access. According to rafting outfitters, the rafting put-in needs improvement to provide safe river access. Additionally, there is no sanitation at the lower access area where rafters are dropped off as the only portable sanitation unit is locked. There is no signage directing rafters to summit the steep access road to locate the toilets at the upper parking area. The access road to the lower drop off location is available only to commercial outfitters but not other boaters. Egress from the West Branch below McKay should also have been evaluated as part of this study. Instead of providing an objective assessment, the study inaccurately concludes, “All of the facilities and amenities associated with this Project recreation site were in good condition.”

The study also included random spot counts at the various formal recreation sites. This methodology tends to undercount actual recreation usage that is concentrated at certain times of day, certain days of the week, and certain days of the year. With regard to whitewater boating, the majority of outfitters launch according to a schedule rather than at random times, and individual paddlers tend to access the river at certain times of the day, likely resulting in an undercount of recreational users. While there is data from the State of Maine on commercial outfitters, there is no corroborating data on use by individual boaters. Parking can also be a poor indicator of usage as boaters tend to carpool and shuttle vehicles to boater take-out locations. It is likely that the study significantly undercounted actual whitewater boating usage.

We acknowledge that while the Whitewater Boating Study did address boating access to a limited extent, access concerns weren’t adequately addressed in either the recreation or whitewater boating study. In the Upper Gorge, for example, the study merely states that access is discouraged because of the steep embankment, and Stone Dam access was ignored entirely. While the licensee compiled the results of paper and online surveys, it collected and analyzed only 34 surveys at all of the Penobscot Mills recreation sites, none of which were collected at Millinocket Stream and none at Stone Dam. An additional study season will be required to collect additional recreation study data.

The study also failed to perform qualitative data collection. FERC's Study Plan Determination recommended that the study include the following methodology:

> Maine BPL, AW/AMC, the Camp Owners Associations and Maine TU request that GLHA's recreation study include qualitative (interview) component to garner input from organizational representatives. Interviews or focus groups with recreation user groups and commercial outfitters are a standard practice in hydropower relicensing proceedings, and would allow for robust understanding of recreation use, needs and interests in the Projects' areas. When combined with the facility assessment reports and quantitative data collected as part of the user surveys, such qualitative information can be useful in developing a licensing proposal that meet the needs of various users [sections 5.9(b)(5) and 5.9(b)(6)]. Therefore, we recommend that GLHA add provisions for interviews or focus groups with interested individuals representing recreation user groups (e.g., whitewater boaters, anglers), commercial outfitters, and campground owner/operators. Adding this component would allow for information to be obtained on the informal and formal recreation sites at the Projects [section 5.9(b)(5)].

Despite FERC's recommendation that the study include qualitative data collection as requested by Maine BPL, American Whitewater, Appalachian Mountain Club, the Camp Owners Associations and Maine Trout Unlimited, the licensee declined to do so and failed to make even a minimal effort to reach out to the stakeholders requesting this study component. Given this omission, the licensee should be required to complete and revise this study report.

6. Whitewater Boating

American Whitewater and Appalachian Mountain Club requested that the licensee study project effects on whitewater boating opportunities on four river reaches in the project boundary: 1) Upper Gorge between Ripogenus Dam and McKay Station; 2) Below McKay Station to Debsconeag; 3) Millinocket Stream below Millinocket Lake Dam; and, 4) West Branch between Stone Dam and Shad Pond. The intent of the study is to identify the acceptable and optimal flow ranges for whitewater boating by individuals currently or potentially utilizing these river reaches under current or alternative modes of operation, evaluate the adequacy of put-in and take-out locations and the need for access improvements, and identify flow information needs that would support whitewater boating use. FERC-approved whitewater boating studies routinely follow the standard methodology as described in Whittaker et al., in "*Flows and Recreation: A guide to studies for river professionals"* (2005). This methodology is designed to assess the presence, quality, and preferred flow ranges for river-based boating resources in a stepwise manner. The process steps are generally 1) desktop analyses, 2) on-land feasibility assessment, and/or on-water single flow assessment, 3) on-water multiple flow assessment.

In its Study Plan Determination, FERC required the licensee to conduct a Level 1 desktop analysis of the four river reaches identified in the study request and required the submission of a study modification request if further study was warranted. The study methodology, however, is designed as a three-phase process with off-ramps where sufficient information is obtained at an earlier stage that makes further study unnecessary. By bifurcating (or trifurcating) the study

methodology, FERC deviated from Whittaker protocols and placed an unnecessary burden on stakeholders to submit a study modification request following FERC's study modification criteria. The need for additional study, however, is defined by the protocols themselves, such as when the desktop analysis fails to identify acceptable and optimal flow ranges.

Determining whether a Level 2 or Level 3 whitewater boating assessment is required turns on the answer to several questions under the Whittaker protocols:

- Are there flow-dependent recreation opportunities on the river segments?
- Are flow-dependent opportunities affected by project operations?
- Are flow-dependent recreation opportunities "important" relative to other resources or foregone power generation? If certain recreation opportunities will not be considered when determining project operation decisions (e.g., if agencies and stakeholders agree that flow releases will be primarily driven by biological needs for an endangered species), more detailed information about flows may be unnecessary, and Level 1 information may be sufficient (assuming it documents stakeholder and agency agreement about this evaluation).
- Does Level 1 information precisely define flow ranges and potential project effects for each flow-dependent opportunity? For example, flow ranges for a commonly boated whitewater reach may be sufficiently well-known and agreed upon, and there may be no need for additional study.

Where a flow-dependent recreational activity lacks precise information about flow needs or project effects, a Level 2 or Level 3 flow study is typically required. Conversely, where a river reach is well known and existing information is sufficient to evaluate the reach, further study may be unnecessary.

At the Ripogenus and Penobscot Mills projects, there is no disagreement that whitewater boating opportunities are flow dependent and directly affected by the licensee's facilities and operations that divert and alter flows that are used by whitewater boaters. Additionally, whitewater boaters have identified these river reaches as important and there are no overriding resource needs that would prevent further consideration of recreational boating. The need for a Level 2 or Level 3 study depends on whether existing information is sufficient to precisely define flow ranges and potential project effects. Of the four river reaches on the West Branch, sufficient information was compiled on two of the four river reaches (McKay Station and Millinocket Stream); however, additional study phases are necessary on two others (Upper Gorge and Stone Dam).

The most well understood reach on the West Branch is the reach between McKay Station and Debsconeag. Since the last license issuance in 1996, more than 250,000 recreational boaters have been guided down this section in rafts by commercial outfitters. The West Branch below McKay Station is the arguably the most renowned whitewater river in the northeast, its closest comparable river reach being the Gauley River in West Virginia. The upper section below McKay features a series of Class III – V rapids through the Penobscot Gorge and Cribworks sections to Big Eddy. This section of the West Branch is known for its powerful hydraulics, waterfall drops, stunning views of Mount Katahdin and frequent wildlife sightings. The 15-mile

reach down to Debsconeag provides both rafters and individual boaters with an unequaled boating opportunity in the region.

The current FERC license requires that the licensee release daytime flows ranging from 1800-2300 cfs between May 1 – October 1 with flows varying within this range depending on the day of week and hydrologic conditions. This flow range is well utilized by both individual boaters and commercial outfitters. The last relicensing assessed the following flows below McKay Station: 1,700-1,999 cfs; 2,000-2,199 cfs; 2,200-2,399 cfs; 2,400-2,599 cfs; 2,600-2,799 cfs; 2,800-2,999 cfs, and 3,000+ cfs. Over 90 percent of respondents were "very satisfied" or "extremely satisfied" with all but one of the flows provided (2,000-2,199 cfs)2 (GNNC 1991). Based on the information available from the last relicensing and surveys completed during the Level 1 study, we believe existing information provided by commercial outfitters and individual boaters is sufficient to understand acceptable and optimal flow ranges. Consequently, further study is unnecessary; however as previously noted, river access concerns at McKay have not been adequately addressed in the study report.

Millinocket Stream between Lake Millinocket and the Millinocket Development tailrace was also evaluated in the study report. At the time of the last relicensing, little was known about this reach and only minimal anecdotal information was available and no controlled flow study was conducted. Over the past two boating seasons, local paddlers have hosted the Millinocket X-Stream Canoe Race on the reach below Lake Millinocket Dam with the support of the licensee. The race draws nearly 100 participants and spectators and paddlers navigate the Class II-III rapids including Locomotive Rips (Turtle Pits Rapids) and other less challenging sections. In 2022, the licensee released a flow of 530 cfs for the canoe race. In surveys and information collected from participants, the 530 cfs flow level was regarded as acceptable but less than optimal due to the shallow depth and exposed rocks in places. In 2023, the licensee released a flow of 728 cfs for the canoe race. While this level was regarded as more challenging for some participants, the flow was regarded as optimal by most race participants. Surveys completed by participants in the Millinocket X-Stream Canoe Race demonstrate that Millinocket Stream is a highly valuable recreational resource under appropriate flow conditions. At the time that AW/AMC filed their initial study request little was known about this reach; however, information collected over the past two years during the canoe race is sufficient to evaluate the recreation potential of this river reach, and no further study is necessary. As with McKay Station, the study should be updated to include a more complete assessment of river access. Additionally, the study should address the flow information needs at Millinocket Stream.

While we agree that a Level 1 under the Whittaker protocols is sufficient to evaluate the McKay Station and Millinocket Stream river reaches, the data and analysis presented in the Whitewater Boating Study is insufficient to evaluate the whitewater boating resource in the Upper Gorge and Stone Dam river reaches.

The Level 1 whitewater boating study contains useful but limited information about the Upper Gorge between Ripogenus Dam and McKay Station. While the study characterizes the reach as short, the value of this reach should be assessed as an extension of the reach below McKay Station as boaters accessing the Upper Gorge would typically continue down past McKay Station. The study report characterizes the Upper Gorge as containing continuous Class

IV/V rapids that would substantially expand the number of challenging and desirable river features at Ripogenus. But for the licensee's flow diversion for generation, boating in the Upper Gorge would be available on a daily basis throughout the boating season. Viewed in this context, the Upper Gorge contains important flow-dependent whitewater boating opportunities that are greatly diminished by project operations.

The need for further study in the Upper Gorge turns on whether Level 1 information precisely defines flow ranges and potential project effects on whitewater boating opportunities. While the study included interviews with 10 individuals who had previously boated the Upper Gorge, the information provided on preferred flow levels was not sufficiently precise to identify minimum and optimal flow levels. Responses provided from those interviewed ranged from 400-5,000 cfs. While the report suggests that a flow of 1,000-1,500 cfs provides a minimum flow and a flow of 2,000-3,500 cfs provides an optimal flow, these are general flow estimates lacking specific dates to confirm the accuracy of these estimates. The lack of a USGS gage at the project makes estimating the flow in the Upper Gorge difficult. Flows shown at McKay reflect the station flow readout, but do not indicate the split between generation and spill.




For this reason, the minimum and optimal flow estimates in the study report are insufficient and proceeding to Level 2/3 is necessary to inform the relicensing process; however, this information is useful for identifying flow targets for the Level 2/3 study. The Level 1 study also failed to adequately evaluate current and alternative access to the Upper Gorge and flow information needs.

The licensee also endeavored to assess whitewater boating on the West Branch between Stone Dam and Shad Pond; however, there is little information available on this reach and the only meaningful information collected by the licensee in this study consisted of interviews with two individuals who previously boated this reach on 2 occasions in 2022. The two boaters estimated the flow levels on those occasions at 3,000 and 5,000 cfs; however, the reach has no flow gage and the dates on which they boated the reach is unknown. At best, the estimates given by two individuals boating at a single flow are anecdotal, unverified, and speculative. The "study" was unable to identify acceptable and optimal flow levels across a range of flows and

only characterized a single river feature – Grand Falls – in the reach. While the study lists a flow range of 700-5000 cfs based on these two interviews and perhaps a minimum flow of 1000-2000 cfs (a flow that neither of those interviewed actually boated), these flow ranges lack any meaningful support. What is clear, however, is that the West Branch below Stone Dam would provide valuable whitewater boating if sufficient flow was available, access improved, and real-time flow information provided. The study failed to evaluate current and alternative access or flow information needs.

At the time of the Initial Study Report Meeting, several boaters including a representative from American Whitewater boated the reach below Stone Dam on May 3, 2023. At that time, the inflatable gate was deflated and water was spilling over the flashboards. This section of the West Branch is boatable at that level by paddlers with advanced skills. The boaters accessed the river below Stone Dam after a long flatwater paddle across Quakish Pond and then climbing out of the channel at Stone Dam. All paddlers judged the reach to be of high quality with continuous rapids and a more challenging drop at Grand Falls. Paddlers then proceeded to a takeout further down in Shad Pond across flatwater. The licensee estimated that the flow on that date was approximately 8,000 cfs.

7. Aesthetics Study

American Whitewater and Appalachian Mountain Club requested that the licensee perform an aesthetics resource study to evaluate the impact of the project facilities and operations on the surrounding environment. This information is necessary for FERC to complete its environmental analysis. In its Revised Study Plan, the licensee proposed to use photo and video documentation rather than conduct an on-site assessment of aesthetic impacts as is typically done. Relying on photo/video documentation rather than on-site observation is of little value because it limits the assessment to a visual observation from a single perspective, omitting a more complete evaluation of the impact of the project on the landscape. Nevertheless, FERC approved the study plan with modifications that include a recommendation for using an interdisciplinary team of representatives from GLHA and stakeholders' groups, stating, "The Aesthetics Study should be conducted in consultation with Maine BPL, AW/ATC (sic), the Camp Owners Associations, and other interested stakeholders."

The licensee declined to follow FERC's recommendation that the study should be conducted in consultation with stakeholders. Instead, the licensee self-evaluated a series of photos taken from its self-selected locations, and unsurprisingly, arrived at the self-serving conclusion that the Ripogenus and Penobscot Mills Projects have high aesthetic value under current operations. Essentially, the licensee is presenting its view that the project has no adverse aesthetic impact under baseline conditions, and since it is proposing no operational changes, there is no need for stakeholder engagement in this study. As conducted by the licensee, the Aesthetics Study provides little useful information that would inform FERC's environmental analysis and the study should be redone following FERC's Study Plan Determination.

8. Environmental Justice

The Environmental Justice Study was requested by the Penobscot Indian Nation and FERC to identify Environmental Justice communities located within the study area and evaluate potential effects of continued operation and maintenance of the Projects on identified Environmental Justice communities. Given the remote and sparsely populated location of most project facilities, the 1-mile study area is overly narrow. The geographic area should address project effects that were not captured using the study methodology. Specifically, the study should address project effects on the Penobscot Indian Nation and other indigenous groups and individuals. These effects include traditional cultural uses such as fishing in project waters in the dewatered section of the West Branch below Stone Dam to Shad Pond. Inexplicably, the study failed to conduct any outreach to the Penobscot Indian Nation who requested the study or engage other stakeholder groups to obtain information on project effects on identified Environmental Justice communities. The study is also deficient in that the mapping and sensitivity receptors was based only on potential impacts from any potential project related construction activities while ignoring project related effects from current operations such as the dewatering of the West Branch below Stone Dam. The licensee should revise the study report by conducting appropriate outreach and documenting the effect of current and future operations on Environmental Justice communities as requested.

Summary

While the licensee's Initial Study Report provides information on its progress in completing studies required by FERC's Study Plan Determination, it is unclear which of these reports the licensee considers completed and which are a work in progress. We regard each of the studies discussed here as incomplete, as follows:

- Historic Operations – Stone Dam flow data is unreliable and does not reflect the licensee's current operations.
- Operations Model – AW/AMC have provided a preliminary list of operations model runs that provide alternative modes of operation to address project effects.
- Water Quality – The study report needs to address whether minimum flows meet wetted width and provide a continuous zone of passage in the Upper Gorge and at Stone Dam. Higher minimum flow levels should be modeled.
- Instream Flows Below Stone Dam – Provide information on the ability of the project to release controlled flows from its inflatable dam and, if necessary, provide information on alternative means of providing instream and recreational flows below Stone Dam
- Recreation – Evaluate the adequacy of informal access locations in the Upper Gorge, Millinocket Stream, and Stone Dam river access points. Assess the adequacy of the McKay Station access based on comments received from recreational stakeholders addressing the put-in and sanitation. Identify and evaluate egress locations used by boaters below McKay Station.

- Whitewater Boating – Complete Level 2 and of necessary Level 3 study of Upper Gorge and Stone Dam river reaches including an analysis of current and alternative river access and flow information needs.
- Aesthetics – Consult with stakeholders on the Aesthetics Study as recommended in FERC's Study Plan Determination.
- Environmental Justice – Outreach to the Penobscot Indian Nation for information on project effects on traditional cultural uses by indigenous groups. Expand the geographic scope of the study and sensitive receptors to document project effects under current operations.

## Conclusion

We respectfully request that the licensees for the Ripogenus Hydroelectric Project and the Penobscot Mills Hydroelectric Project update the draft studies incorporating the feedback herein, and complete the following studies by either continuing studies consistent with the approved SPD methodology or to continue to further study where study goals and objectives have not been achieved, including: (1) Recreation Facility Inventory, Recreation Use and Needs Assessment, Aesthetics and Reservoir Surface Area Assessment Study; (2) Controlled-flow Whitewater Boating and Access Study; and, (3) Aesthetics Resources Study. Completing these studies as described herein by AW/AMC will provide FERC with sufficient information to complete its NEPA analysis of project impacts to determine appropriate license conditions that are protective of recreation values and mitigate project impacts. Thank you for considering these comments.

Respectfully submitted this 6th day of July, 2023

Very truly yours,






Bob Nasdor
Northeast Stewardship and Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776
(617)-584-4566
bob@americanwhitewater.org

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
100 Illick's Mill Rd.
Bethlehem, PA 18017
(610)-868-6915
mzakutansky@outdoors.org

July 5, 2023

Ms. Kimberly D. Bose
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Via online submission to: http://www/ferc.gov**

Subject: **Comments of Maine Council of Trout Unlimited on the Initial Study Report for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458)**

Dear Secretary Bose:

On behalf of its six chapters and over 2,000 members, Maine Council of Trout Unlimited (TU) submits these comments on the Initial Study Report (ISR) for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) filed for Great Lakes Hydro America, LLC by Brookfield Renewable ("Brookfield" or "Applicant") dated April 24, 2023.[1] This filing also references the Report of the ISR Meeting[2] held May 2 through May 4, 2023 in Millinocket, ME.

The amount of information contained in these reports is considerable, and for clarity and ease of reference, following our general comments, specific TU comments will be organized as a series of appendices corresponding to those in the ISR. Comments regarding the hourly flow data supplied by Brookfield with the ISR are included with Appendix A.

**General Comments**

Taken together, the Ripogenus and Penobscot Mills relicensings reflect over 108,000 kw of generation capacity making this the largest relicensing effort in the state of Maine in terms of electricity production by a large margin. The waters and surrounding habitat affected by these relicensings are of equal stature. The land-locked salmon fishery below Ripogenus Dam is sustained by naturally spawned fish and nationally known for its quality. With Maine's highest mountain nearby, Ripogenus Gorge below the dam is Maine's most spectacular gorge. The waters of the Penobscot Mills Project are also important in their own right and should play a part in the restoration of currently dewatered sections of the West Branch of the Penobscot River to provide traditional waterways and sustenance fisheries to the Penobscot Indian Nation (PIN) that have been so long promised but not delivered.

**Year-one studies have not provided the information required to make informed decisions on the terms and conditions of a new license.** Change of project ownership has resulted in changes to the way the projects are operated, starting at and most affecting the Ripogenus Project and extending downstream to Penobscot Mills Project. In a number of cases, studies modified in year one did not provide the information they were intended to provide or served to underline the need for additional studies. Additional information is needed to limit the drawdowns to the Ripogenus-Chesuncook Reservoir and to peaking operations being conducted at McKay Station. From McKay Station to Stone Dam, the watershed has been extensively modified, and how to optimize project operations so as to

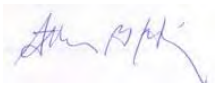
[1] Great Lakes Hydro America, LLC, Initial Study Report for the Ripogenus (FERC No. 2572-133) and Penobscot Mills (FERC No. 2458-247) Hydroelectric Projects dated April 24, 2023.
[2] Initial Study Report Meeting Summary for the Ripogenus Hydroelectric Project (FERC No. 2572-133) Penobscot Mills Hydroelectric Project (FERC No. 2458-247) dated May 22, 2023.

provide the best balance of between electrical power generation and the other uses including fishing, recreation (especially whitewater), aesthetics, and habitat must be found. Specific comments in the appendices will identify specific information needs and present them in accordance with the FERC process.

**Conclusion**

Maine TU Council appreciates the opportunity to provide these comments on these important projects and hopes that the Commission will act to acquire the information needed to enable the Commission to balance project harms and benefits.

Respectfully,



Stephen G. Heinz
Maine TU Council FERC Coordinator

**Appendices:**

Appendix A: Historic Operations Data Assessment Study

Appendix B: Operations Model Study

Appendix C: Water Quality Study

Appendix D: Fish Assemblage Study

Appendix E: Fish Stranding Study and Ramping Study

Appendix F: Instream Flow and Habitat Assessment of West Branch Downstream of Stone Dam Study

Appendix G: North Twin Impoundment Tributary Access Survey Study

Appendix H: Upstream Eel Passage Assessment Study

Appendix I: Desktop Downstream Eel Passage Route and Survival Study

Appendix J: Terrestrial, Wildlife, and Botanical Resources Study

Appendix K: Riparian and Littoral Habitat Assessment Study

Appendix L: Loon Management Plan Assessment Study

Appendix M: Marsh Bird Survey Study

Appendix N: Furbearer Survey Study

Appendix O: Wood Turtle Habitat and Presence Study

Appendix P: Recreation Study

Appendix Q: Whitewater Boating Assessment Study

Appendix R: Aesthetics Study

Appendix S: Historic Architectural Survey

Appendix T: Environmental Justice Study

# Appendix A

**Historic Operations Data Assessment Study**

**General Comments**

The study does not work with the Historic Operations Data Assessment Study and Operations Model Study to inform the relicensing as intended by the SPD:

> "GLHA would use the existing operations information, along with GLHA's proposed Water Quality Study, Historical Operations Data Assessment, and Operations Model, to assess the Projects' effects on the hydrology in the West Branch and mainstem Penobscot River [section 5.9(b)(4)" [SPD, page B-42].

The study does not provide details of why the Ripogenus-Chesuncook Impoundment was so severely dewatered during the summers of 2020 and 2021.

It should also be noted that the possible license violation reported by TU [TU letter dated May 12, 2022, Subject: Maine Council of Trout Unlimited Comments on the Minimum Flow Excursion Report dated April 28, 2022 for the Ripogenus Project (P-2572)] is still under active investigation by FERC Compliance: "Commission staff are actively working on this proceeding, and response has not yet been issued regarding this matter." [email Andrea Claros to Steve Heinz RE: Pending West Branch Possible License Violation dated June 8, 2023]

**Specific Comments**

Page A-1 The study does not effectively meet its objectives:

> "The goals and objectives of the study are to compile relevant historic operations data for the Projects to allow stakeholders to better understand historical operations of the Projects and associated water management objectives in support of the relicensing of the Projects."

The information contained in the ISR does not do that. How flows are managed for the Ripogenus Project remain unknown and explained by Brookfield as controlled by use of the CHEOPS model, a proprietary 'black box.' This cannot be used as rationale for avoiding informed discussion of how the projects are actually operated.

The study uses the term "waste flow" to label all non-station flows. This includes fishing flows of 100 cfs released using the sluiceway that are fishing flows. Another term should be used.

The study does not answer key questions: why was the Ripogenus-Chesuncook drawn so far down in both 2020 and 2021? Why are peaking operations being conducted as indicated by the attached study?

TU requests OPs Model runs documenting the inputs used to determine McKay Station flows including Ripogenus - Chesuncook Impoundment level elevation and a detailed description of the information used to determine the target impoundment levels:

1. October 16, 2019, December 20, 2019, March 4, 2020
2. October 16, 2020, December 20, 2020, March 4, 2021

3. October 16, 2021, December 20, 2021, March 4, 2022

October 16, 2021 was when Brookfield reduced spawning/incubation flows to 1100 cfs, March 4, 2022 was when they further reduced them to 800 cfs, December 20 is a rough mid-point. [Brookfield letter dated April 28, 2022, Ripogenus Project (FERC No. 2572-ME); Minimum Flow Excursion] The CHEOPS model alone cannot explain why in the first two timeframes, Brookfield made no effort to fill the reservoir while in the last timeframe it obviously did.

Page A-27 "Over the 23-year period, the Ripogenus impoundment was refilled to or near full pond elevation by late spring for 17 of the 23 years. The 6 years in which the impoundment elevation was not refilled to or near full pond elevation occurred during dry water years in 2001-2004, 2015-2016, and 2021 (Figures 7 and 8)." It is acknowledged that impoundment levels were unacceptably low during the summer of 2020 as well. Over time, it has become increasing difficult to refill the impoundment. A more aggressive approach to water management is needed. One was taken to full the reservoir over the winter of 2021 to 2022.

Page A-33 The figures showing hourly McKay Station flows based on generation data show flows of 4000 cfs, especially Figure 12 below. These exceed the 3500 cfs hydraulic capacity of McKay Station [Pre-application Document dated June 11, 2021, page 4-14. When queried at the ISR Meeting, the Brookfield response was the flows were not completely accurate and a range of variability was not available. This continues to cast doubt on the results of the analysis.

**Figure 12. Estimated hourly flows from McKay Station, 2000-2010**



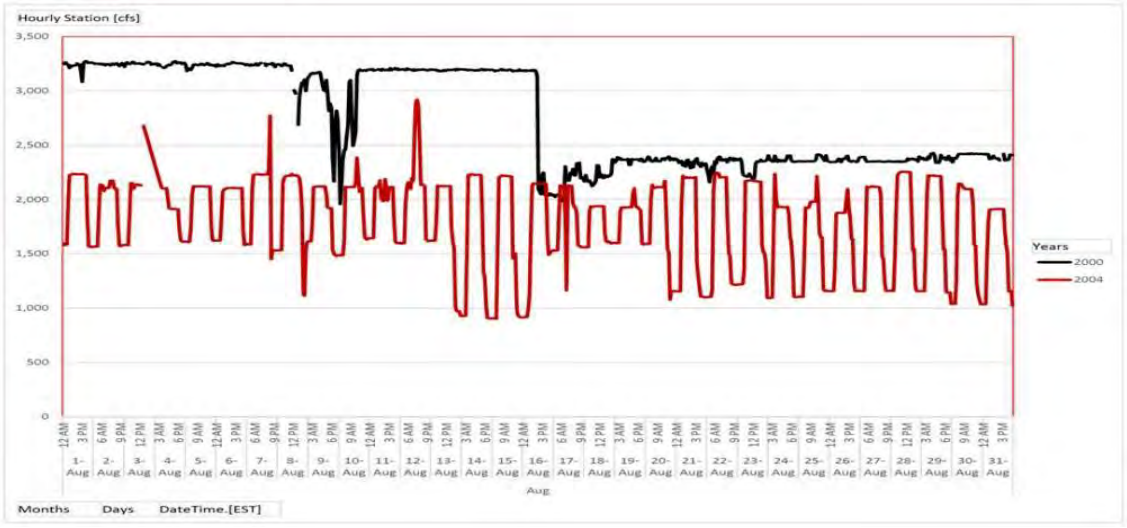
Page A-60 “The Ripogenus and Penobscot Mills Projects are operated as a combined system using the same system-wide rule curve as described above that has been used since the 1970s.” This does not explain how the Ripogenus-Chesuncook Impoundment was dewatered during the summers of 2020 and 2021 with any specificity, or aid in determining how this might be avoided in the future.

**Hourly Flow Data Comments**

The time delay between the request for the flow data and its submission by Brookfield underlines the need for a USGA flow gage and impoundment level gauge be installed for the Ripogenus Project. The flow gauge should be located immediately below Ripogenus Gorge in the Little Eddy vicinity.

It has been an open issue if project operations have changed since project ownership passed from Great Northern Paper. Increased peaking was reported by MDIFW in its PAD comments: “In addition, there is concern that the West Branch of the Penobscot River below McKay Station is managed as more of a peaking operation with flows exceeding 3,000 cfs during the day and 1,800 cfs or less in the evenings. Flow changes of this magnitude in a short period of time can dewater areas of the river and result in a loss of macroinvertebrate diversity and habitat, as well as cause direct mortality. MDIFW believes the summer drawdowns and peaking operations were not fully anticipated in the review of the current license and therefore the water management plan may need to be refined. This study, along with the requested lake elevation and flow data, will provide information about the degree, frequency, and possible impacts resulting from the drawdowns and changes in flow. [MDIFW letter October 8, 2021, Re: MDIFW Comments and Study Requests for the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458), pages 35 and 36.]

Brookfield provided hourly flow data requested by MDIFW and other agency filings with the ISR Meeting Report. A preliminary analysis of August and November data performed by the National Marine Fisheries Service indicated that operations have changed and that peaking is occurring. The following example demonstrates this, many of the graphs making the comparison show 2000 flow patterns were more stable than subsequent years. This is consistent with what TU has been told through anecdotal reports.



Current studies confirm that such release practices affect both macro-invertebrate communities and fish. “The degree of hydropeaking, proximity of unregulated tributaries, and distance from the dam have been shown to have a large influence on the ultimate abundance and diversity of aquatic macroinvertebrates. [The ups and downs of hydropeaking: a Canadian perspective on the need for, and ecological costs of, peaking hydropower production, K. E. Smokorowski; Hydrobiologia (2022) 849:421–441, page 429.] “… hydropeaking operations do have negative effects on fish populations, particularly smaller bodied species or life stages, the ultimate effect on fish populations is determined by degree of hydropeaking…” [Id., page 431.] This is consistent with the results of the Stranding Study and underlines the need for a Ramping Study to determine optimal flow levels and ramping rate to achieve them to minimize or eliminate negative effects of flow changes.

TU also notes that it is well established that when flows change abruptly, fishing is disrupted for about an hour while fish readjust to the new flow. Peaking effectively takes two hours from a full fishing day, decreasing the recreational use of the resource. This is inconsistent with the world-class fishery described in the last license application for the Ripogenus Project.

# Appendix B

**Operations Model Study**

**General Comments**

For the reasons explained below, the Operations Model Study does not satisfy FERC's rationale for the study: "GLHA would use the existing operations information, along with GLHA's proposed Water Quality Study, Historical Operations Data Assessment, and Operations Model, to assess the Projects' effects on the hydrology in the West Branch and mainstem Penobscot River [section 5.9(b)(4)" [SPD, page B-42].

**Specific Comments**

1. **The use of "Daily changing target elevations" (instead of the prescribed operational targets) at Ripogenus, North Twin, and Millinocket Lake Storage in the Verification scenario needs to be clearly defined, explained, and justified.**

   The report states that "Daily changing target reservoir elevations to simulate historical operations for the Ripogenus, North Twin, and Millinocket Lake developments." for the Verification scenario (page B-27). Only in the notes for Attachment 1 does the report clarify that "for Ripogenus, North Twin, and Millinocket Lake developments, the target elevation is the historical end of day elevation reported by GLHA from the historical operations in NGVD29."

   The clarification that the "Daily changing target reservoir elevations" refers to the "historical elevations" should be mentioned and more clearly explained within the body of the report and not in an appendix note. Without further explanation, we conclude that this decision was made to make the model simulations appear more accurate than they would have been should the actual operational targets have been used.

   Furthermore, historical elevations were only used at three of the developments, while the Baseline operational targets were used at all other developments. Why use historical elevations at some but not others? This inconsistency requires explanation.

   Lastly, because **historical** elevations were used instead of **target** elevations, the results for the Verification scenario do not support the conclusion that "the Operations Model compares well to historical data, characterizes system operations, and is appropriate for use in evaluating the effects of alternative operating scenarios on generation, reservoir levels, and outflows from the System" (page B-102). **Target elevation curves are one of the most important elements of reservoir operations. Excluding these targets from the Verification Scenario means the model was not in fact evaluated for its ability to characterize system operations, but for its ability to simulate historical conditions using those historical conditions as a primary input.** In other words, by using historical elevations as an input to the model and then concluding that the simulated output elevations are reasonably accurate compared to those same historical elevations is circular logic: the same proposition occurs as both a premise and a conclusion—the argument validates itself.

2. **The report concludes the model is verified based on historical elevations, but contains insufficient comparisons of historical and simulated reservoir elevations.**

The start of Section 6.1.1 states that "The Verification scenario established in the Operations Model followed the historical operating requirements of the System by simulating daily changing target elevations to match historic elevations, historical reported spillway flows, and unit outages to simulate historical daily turbine operations" (page B-92).

However, the report does not include any quantitative evaluation of model accuracy in terms of simulating reservoir elevations. Tables 6-1 through 6-5 and Table 6-6 provide bases for evaluating model accuracy for simulating power generation and release flows, respectively. A similar comparison is not provided for reservoir elevations.

Example: Table 6-1 McKay Station [ISR page B-94]

**Table 6-1. McKay Station Verification generation comparison.**

| Year | Historical Generation (MWh) | Simulated Generation (MWh) | Difference between Historical and Simulated (MWh) | Percent Difference between Historical and Simulated (%) |
|---|---|---|---|---|
| 2015 | 211,964 | 228,520 | 16,556 | 7.81% |
| 2016 | 218,799 | 221,628 | 2,829 | 1.29% |
| 2017 | 220,978 | 221,141 | 163 | 0.07% |
| 2018 | 242,539 | 238,860 | -3,679 | -1.52% |
| 2019 | 256,618 | 240,347 | -16,271 | -6.34% |
| 2020 | 229,420 | 238,917 | 9,497 | 4.14% |
| **Average** | **230,053** | **231,569** | **1,516** | **0.66%** |

**Presumably, the conclusion that the model was verified in terms of simulating historical elevations was based on the graphical comparisons in Attachment 1. However, none of those figures includes the historical elevation for comparison against the simulated elevation.** These figures only include the target and simulated elevations. Only the figures for Ripogenus, North Twin, and Millinocket Lake developments include the historical elevation, but only because the historical elevations were used in place of the target elevations. In other words, the figures for these developments may include the historical elevations, but they are labeled as "Target Elevation," which makes it challenging for the reader to make the comparison of historical vs simulated elevations.

**Figure Attachment 1-10. Verification simulated Ragged Lake operations 2015.**

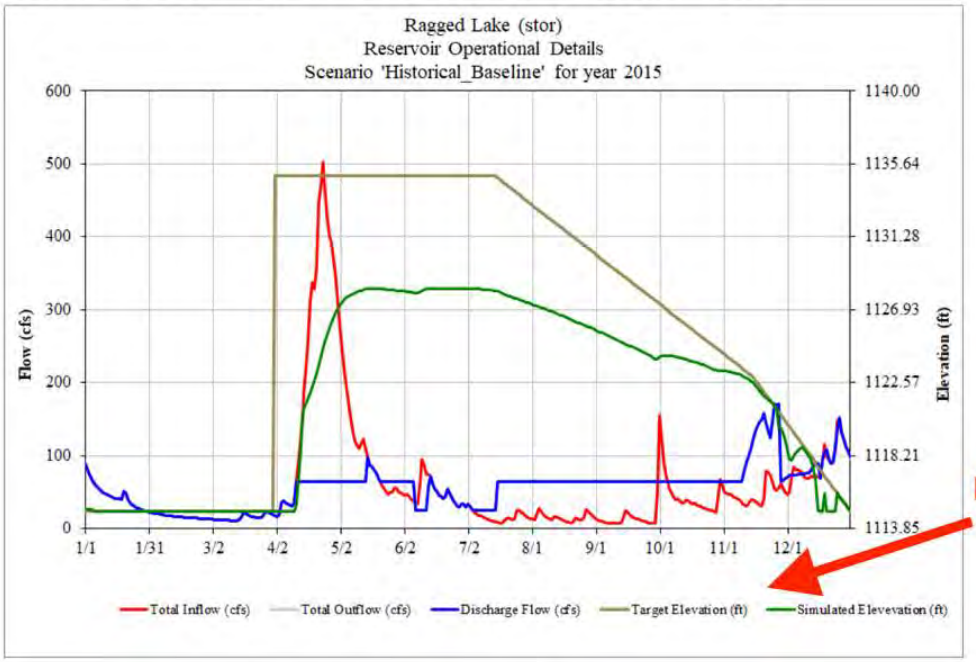
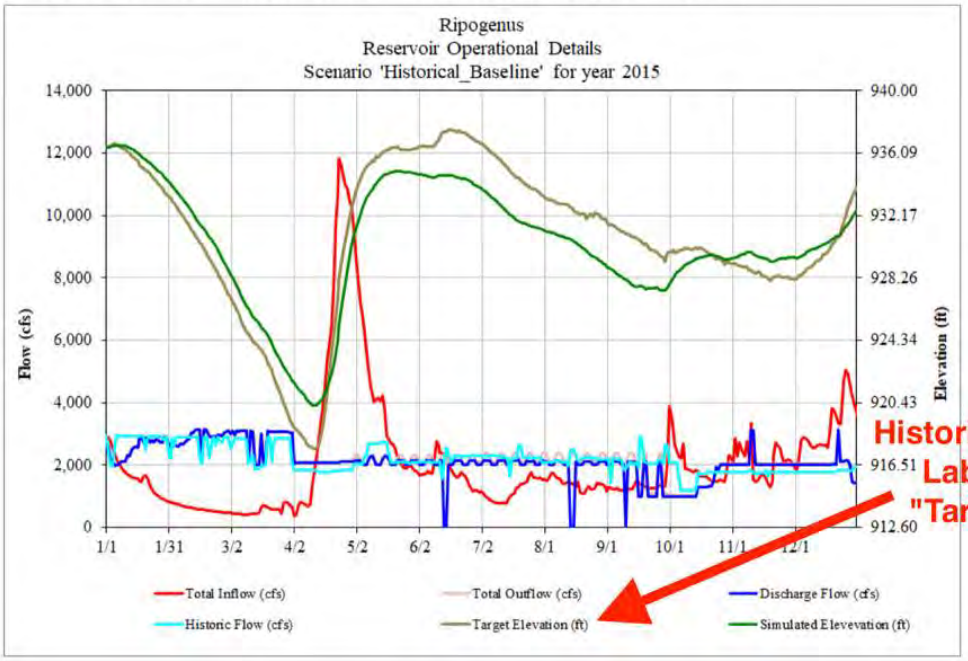



**Figure Attachment 1-11. Verification simulated Ripogenus operations 2015.**




To justify the conclusion that the model can simulate historical elevations in addition to power generation and release discharge, the report should include a quantitative comparison for reservoir elevations similar to Tables 6-1 through 6-6 and graphical comparisons that include both the historical and simulated elevations.

**3. The Operations Model Study fails to explain the derivation of the primary target elevations or why operations deviated from those targets in previous years, especially for the Ripogenus development.**

The report states that "At Ripogenus Dam, the impoundment water elevation is based on an annual rule curve that has prescribed weekly elevations that are used as a guideline to set the pond level based on the time of year. GLHA uses these elevations in conjunction with the storage available in the upstream storage ponds along with snowpack estimates in the winter months and forecasted precipitation to determine operations to maintain adherence to the rule curve" (page B-54). The target elevation curve is then provided in Table 5-5.

**Given the importance of these target elevations, a more detailed explanation for how these target elevations were identified is warranted.** For example, why lower the pool to 921.6 ft NGVD29 on April 1, why not 922 ft? What is the basis for 921.6 ft on April 1, as well as each of the other target elevations, orange highlighting supplied?

**Table 5-5. Ripogenus Development target elevation curve.**

| Date | Elevation (feet, NGVD 29) |
|---|---|
| **Target Elevations** | |
| Jan 1 | 928.6 |
| Mar 1 | 923.7 |
| Apr 1 | 921.6 |
| May 10 | 939 |
| Jul 1 | 939 |
| Oct 15 | 928.8 |
| Dec 31 | 928.6 |
| **Target Minimum Elevations** | |
| Jan 1 | 913.6 |
| Dec 31 | 913.6 |

Furthermore, the report does not discuss reasons for why the historical operations deviated from these targets. In some cases, notably in 2020 and 2021, the operational decisions that led to low reservoir levels in the Ripogenus had negative impacts on the shoreline community. Figure 1 below shows the Verification Scenario figures from Attachment 1 with the target rule curve superimposed (thick red line supplied). This figure clearly shows in what years and seasons the historical reservoir elevations deviated from the Baseline target, most notably in 2018 and 2020, areas of concern circled in orange for clarity.

Figure Attachment 1-11. Verification simulated Ripogenus operations 2015.

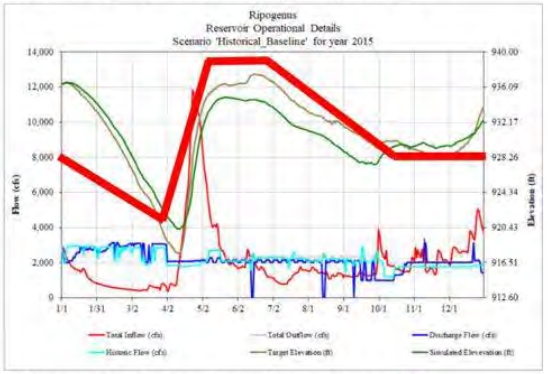



Figure Attachment 1-29. Verification simulated Ripogenus operations 2016.

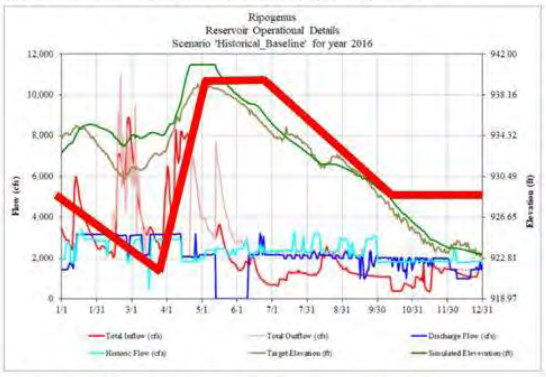



Figure Attachment 1-47. Verification simulated Ripogenus operations 2017.

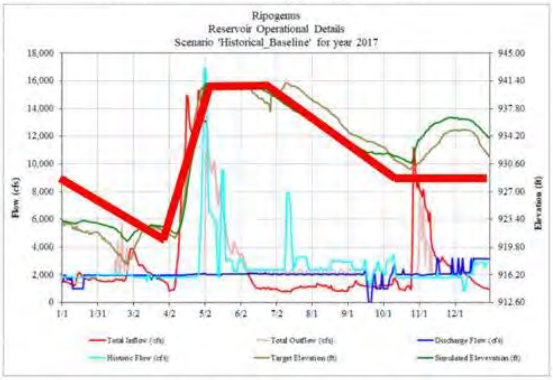



Figure Attachment 1-65. Verification simulated Ripogenus operations 2018.

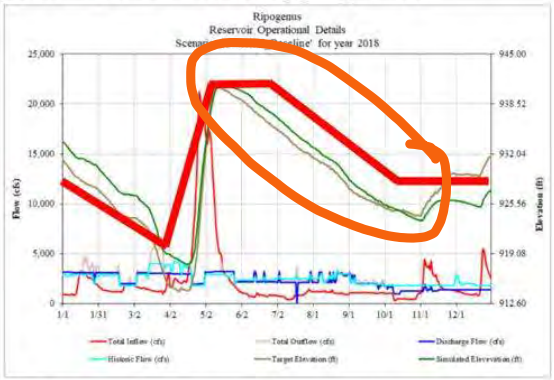



Figure Attachment 1-83. Verification simulated Ripogenus operations 2019.

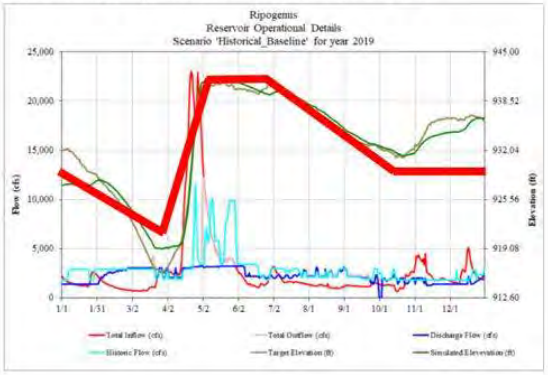
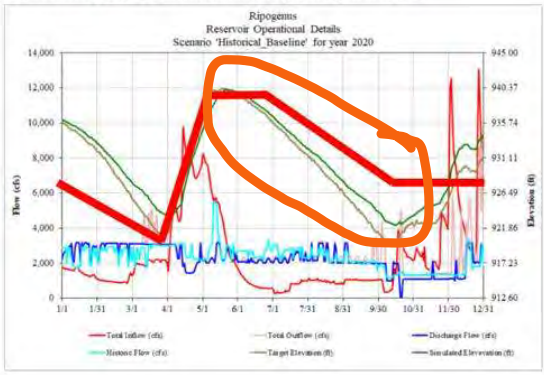



Figure Attachment 1-101. Verification simulated Ripogenus operations 2020.




**4. The Operations Model Study Report does not explain how this model will be used to develop and compare alternative operations.**

The report concludes that "the Operations Model…is appropriate for use in evaluating the effects of alternative operating scenarios on generation, reservoir levels, and outflows from the System" (page B-102).

It is not clear how those alternatives will be developed and evaluated. Given the historical negative impacts of the Ripogenus operations, especially in 2020-2021, the development and comparison of alternative operations is a critical component of the relicensing process in order to ensure the next license contains operational constraints to minimize those impacts.

**Summary of Requests**

TU requests that the Operations Model Study be resubmitted modified as described below as provided by (18 CFR 5.15(d)) paragraphs (c)(1)–(4) "(1) Approved studies were not conducted as provided for in the approved study plan;"

That the report include a clear **definition, explanation, and justification of using "Daily changing target elevations" at Ripogenus, North Twin, and Millinocket Lake Storage in the Verification Scenario**. This revision must explain how the use of historical elevations in place of target elevations at these developments supports the conclusion that the model "…compares well to historical data, characterizes system operations, and is appropriate for use in evaluating the effects of alternative operating scenarios on generation, reservoir levels, and outflows from the System" when it did not include a central component of the operational rules (namely the target elevations) in the Verification Scenario.

That the report **include quantitative (tabular) comparisons between historical and simulated reservoir elevations** for the Verification Scenario, and that **historical elevations be added and clearly labelled to the graphical comparisons in Attachment 1**.

That the report **explain: 1) the basis for the target elevations used for the Baseline Scenario (e.g., Table 5-5) and 2) reasons that historical operations led to major deviations from those target elevations** (e.g., late-summer draw down of Ripogenus in 2018 and 2020).

That Brookfield **specify the format required for requesting alternative target levels or other operational rules** to be simulated using the Operations Model. Note that such requests are NOT subject to the July 6 ISR Comment deadline.

At the ISR Meeting, "Randall Dorman (GLHA) said he anticipates that GLHA will convene a working group to develop alternative operating scenarios, and noted that alternatives should be based on study results and that stakeholders should be prepared to describe the reasoning behind any alternative request." [ISR Meeting Report, page 4]. Request that **details relating to the function of this group be published no later than with the Updated Study Report**. This would include: a plan and schedule detailing how this model will be used to evaluate alternative operating scenarios, who will participate in that process, and over what timeline.

# Appendix C

**Water Quality Study**

**General Comments**

In 2020, the Maine Legislature upgraded the West Branch from Class A to Class AA from a point 1000' below McKay station to Ambejejus Lake (MRS 38 §467.7.C(1)(d-1)). Class AA standards require that "the habitat must be free-flowing and natural" and "aquatic life …shall be as naturally occurs". While the habitat in the segment below McKay station is free-flowing, the current flow management may create 'unnatural' habitat conditions that violate the Class AA aquatic life criteria (DEP Chapter 579).

While the specific water quality studies themselves were generally favorable, details of other studies will have bearing on the FERC Environmental Analysis and Water Quality Certification. We have included them in this appendix.

The dewatered project areas Ripogenus Gorge above McKay Station (except for overflow and leakage 9 months of the year) and the Maine steam of the West Branch below Stone Dam Station (except for overflow) remain special concerns due to significant loss of habitat.

**Specific Comments**

Page C-2 The report quotes 38 MRS §464-9(A):

> "(3) The project creates an impoundment that is subject to water level fluctuations that have an effect on the habitat and aquatic life in the littoral zone so that the habitat and aquatic life differ significantly from that found in an unimpounded great pond; and
> (4) The existing impounded waters are able to support all species of fish indigenous to those waters and the structure and function of the resident biological community in the impounded waters is maintained."

The applicant then does not apply this standard fully, notably subparagraph (4) to the Results section that follows in the Water Quality Study Report. See Page C-103 and C-107 comments below.

Page C-81 Macroinvertebrate studies below Stone Dam did not meet Maine Water Quality Criteria. "The rock basket samplers installed downstream of Stone Dam for a 29-day period beginning on July 20, 2022, did not meet MDEP criteria specifying that an average of 50 specimens across the three replicates be collected to evaluate attainment." DEP Chapter 579. 3.G.(2)(a) states that a determination of nonattainment can be made when there are no confounding sampling factors (as indicated in paragraph 3.G.(1)) which could be applied in this case (i.e., the low count of organisms is not due to a sampling error but due to the stressed habitat). Note that the West Branch segment below Stone Dam is presently listed in the Maine DEP's 305(b) list of nonattaining waters (category 4C).

Page C-103 Table 5.2-14 Although historically present, 2022 sampling did not confirm the presence of lake trout, lake whitefish, or American eel.

**Page C-107 Tables 5.2-17 through 20 while showing diversity, do not confirm that the project is supporting the structure and function of the resident biological community. There is no data in the report about macroinvertebrate species presence or absence**, example: mussel species in the littoral zone. While the composition may differ, the structure and function of the resident biological community in the impounded waters must be maintained. It is difficult to see how this would have been achieved given the severe drawdowns of the impoundment that occurred during 2020 and 2021. Following MDEP guidance, three-quarters of the littoral zone should be kept watered to maintain the "structure and function of the resident biological community in the impounded waters" of this critical lake habitat zone. That did not occur for significant portions of those years.

The effects of drawdowns on nesting loons in the impoundment were significant: nesting platforms not used from 2002 to 2010 at most sites. No data from 2010 on. Brookfield says observations were made but not recorded. Lake levels needed for successful loon nesting has not occurred 3 out of the last 11 years. [ISR, Appendix L]

In the absence of additional information, Maine Water Quality Certification criteria necessary to protect designated uses have not been shown to have been met and a Use Attainability Analysis (UAA; 38MRS §464.2-A) should be conducted before modifying any of the designated uses of these waters to allow the project to gain Clean Water Act Certification.

Page C-111 Ripogenus Gorge. Managed for salmonids, temperatures exceeded 23 degrees Celsius in early August.

Page C-134 Macro-invertebrate Study below McKay Tailrace: "Due to the relative abundance of Hydropsyche at this site, the Shannon Diversity index score of 1.53 trends towards an imbalance in the distribution of individuals among all taxa present." This may present a problem regarding the upgraded Water Quality Classification.

Page C-173 Below Millinocket Lake Dam. Temperatures exceeded 27 degrees in mid-August.

Page C-182 Below Stone Dam. Temperature exceeded 25 degrees Celsius in both July and August.

The Fish Assemblage Study uses data collected in 2003 [Fish Assemblage Study Report, page D-4 and D-8] that is over 20 years old. American Rivers v. Federal Energy Regulatory Commission (American Rivers III), ELR Citation: 48 ELR 20113, No(s). 16-1195 (D.C. Cir. Jul 6, 2018), page 29 established a decade as a reasonable study period of usefulness. **Fresh data is needed to confirm the presence of native fish as required by MDEP.**

It is also significant that the habitat created by releasing water through the sluiceway from July 1 to September 30 uses the warmest water in the Ripogenus - Chesuncook Impoundment. This appears to be attracting fall fish rather than the landlocked salmon and brook trout that it was designed to provide a fishery for [Fish Assemblage Study Report, page D-71], orange highlighting provided for clarity.

**Table 29 Fish collected in the Upper Gorge (All Methods)**

| Species | No. Captured | Percent of Total |
|---|---|---|
| Fallfish | 24 | 34.3% |
| Blacknose Dace | 15 | 21.4% |
| White Sucker | 12 | 17.1% |
| Landlocked Salmon | 11 | 15.7% |
| Slimy Sculpin | 4 | 5.7% |
| Creek Chub | 2 | 2.9% |
| Brook Trout | 1 | 1.4% |
| Yellow Perch | 1 | 1.4% |
| **Total** | **70** | **100.0%** |

Contrast this with four sites sampled downstream [Fish Assemblage Report, page D-75] This cannot be described as natural.

**Table 33 Fish species collected by raft electrofishing in the West Branch Penobscot River survey area at four sites in August and September 2022 with life stage, native status, foraging, tolerance, fluvial, reproductive, and thermal guilds, and numbers and biomass in aggregate across eight samples**

| Species Name | Life Stage | Native Status | Forag-ing Guild | Toler-ance | Fluvial Guild | Repro-ductive Guild | Thermal Guild | No. Fish | Rel. No. (per Km) | % by No. | Rel. Wt. (g) | % by Wt. | Av. Wt. (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brook Trout | Y | N | C | I | FD | LN | S | 2 | 2.0 | 0.34 | 5 | 0.03 | 2.5 |
| Brook Trout | A | N | C | I | FD | L | S | 6 | 6.0 | 1.02 | 390 | 2.59 | 65.0 |
| Landlocked Salmon | A | N | C | I | FD | LN | S | 48 | 48.0 | 8.19 | 4055 | 26.90 | 84.4 |
| Landlocked Salmon | B | N | C | I | FD | LN | S | 64 | 64.0 | 10.92 | 414 | 2.75 | 6.4 |
| Landlocked Salmon | Y | N | C | I | FD | LN | S | 29 | 29.0 | 4.95 | 28 | 0.19 | 0.9 |
| Rainbow Smelt | C | N | I | M | D | L | M | 2 | 2.0 | 0.34 | 15 | 0.10 | 7.5 |
| White Sucker | A | N | I | T | FD | NGL | M | 41 | 41.0 | 7.00 | 5867 | 38.93 | 143.0 |
| White Sucker | B | N | I | T | FD | NGL | M | 21 | 21.0 | 3.58 | 424 | 2.81 | 20.1 |
| White Sucker | C | N | I | T | FD | NGL | M | 2 | 2.0 | 0.34 | 750 | 4.98 | 375.0 |
| White Sucker | Y | N | I | T | FD | NGL | M | 37 | 37.0 | 6.31 | 43 | 0.29 | 1.1 |
| Creek Chub | A | N | I | T | MG | L | E | 6 | 6.0 | 1.02 | 12 | 0.08 | 2.0 |
| Common Shiner | C | N | I | M | FD | NGL | E | 22 | 22.0 | 3.75 | 18 | 0.12 | 0.8 |
| Northern Pearl Dace | C | N | G | S | FD | NGL | S | 9 | 9.0 | 1.54 | 27 | 0.18 | 3.0 |
| Eastern Blacknose Dace | C | N | BI | S | FS | NGL | M | 40 | 40.0 | 6.83 | 54 | 0.36 | 1.3 |
| Fallfish | A | N | G | M | FS | LN | E | 11 | 11.0 | 1.88 | 610 | 4.05 | 55.4 |
| Fallfish | B | N | G | M | FS | LN | E | 18 | 18.0 | 3.07 | 50 | 0.33 | 2.7 |
| Fallfish | C | N | G | M | FS | LN | E | 27 | 27.0 | 4.61 | 209 | 1.39 | 7.7 |
| Fallfish | Y | N | G | M | FS | LN | E | 97 | 97.0 | 16.55 | 35 | 0.23 | 0.3 |
| Lake Chub | C | N | BI | I | FD | NGL | S | 35 | 35.0 | 5.97 | 109 | 0.72 | 3.1 |
| Eastern Silvery Minnow | C | N | G | M | MG | NGL | E | 1 | 1.0 | 0.17 | 3 | 0.02 | 3.0 |
| Brown Bullhead | C | N | G | T | MG | P | E | 1 | 1.0 | 0.17 | 22 | 0.15 | 22.0 |
| American Eel | A | N | C | T | D | nc | M | 6 | 6.0 | 1.02 | 860 | 5.71 | 143.3 |
| Eastern Banded Killifish | C | N | I | T | MG | VN | E | 1 | 1.0 | 0.17 | 2 | 0.01 | 2.0 |
| Burbot | A | N | C | S | FD | NGL | S | 1 | 1.0 | 0.17 | 500 | 3.32 | 500.0 |
| White Perch | Y | IS | C | M | MG | L | M | 1 | 1.0 | 0.17 | 2 | 0.01 | 2.0 |
| Smallmouth Bass | B | IC | C | M | MG | LN | E | 5 | 5.0 | 0.85 | 9 | 0.06 | 1.8 |
| Redbreast Sunfish | C | N | I | M | MG | PN | E | 7 | 7.0 | 1.19 | 77 | 0.51 | 11.0 |
| Yellow Perch | A | N | C | P | MG | V | M | 10 | 10.0 | 1.71 | 240 | 1.59 | 24.0 |
| Yellow Perch | C | N | C | P | MG | V | M | 15 | 15.0 | 2.56 | 145 | 0.96 | 9.6 |
| Yellow Perch | Y | N | C | P | MG | V | M | 2 | 2.0 | 0.34 | 1 | 0.01 | 0.5 |
| Slimy Sculpin | C | N | BI | P | FS | NGL | S | 19 | 19.0 | 3.24 | 96 | 0.64 | 5.0 |
| 20 species | | 18 N | | | | | | 586 | 586.0 | | 15072 | | |

**Life Stage**: A - adult; B - juvenile; Y - young of year; C - not determined; **Native Status**: N – native, IC – introduced of intracontinental origin; IS – introduced of interstate origin; **Foraging Guild**: I – invertivore, BI – benthic insectivore, C – top carnivore, G – generalist; **Tolerance**: I – highly intolerant; S – sensitive (moderately intolerant); M – intermediate; P – moderately tolerant; T – highly tolerant; **Fluvial Guild**: FS – fluvial specialist; FD – fluvial dependent; MG – macrohabitat generalist; D – diadromous; **Reproductive Guild**: NGL – non-guarding lithophil [simple lithophil], LN – lithophilic nester, L – lithophil, V – vegetation, P – psammophil [sand-fine gravel], PN - psammophil nester, nc - not classified; **Thermal Guild**: S – temperate stenotherm; M – temperate mesotherm; E – temperate eurytherm.

North Twin Littoral Zone North Twin, dewatered area exposed more than 75 per cent of the littoral zone [Riparian-Littoral Study, page K-16

> "The minimum elevation of the impoundment during the low water year (2021) was 482.80 feet, which is approximately 9.12 feet below the normal full pond elevation of the impoundment. At this elevation, approximately 4,921 acres were exposed, which is approximately 26 percent of the total surface area of the impoundment. This is similar to the amount of exposed area under the 11-year average annual minimum elevation at the Project (482.26 feet), which resulted in approximately 5,081 acres of exposed area and equates to approximately 27 percent of the total surface area of the impoundment."

# Appendix D

**Fish Assemblage Study**

**Comments**

No Lake whitefish were collected during this round of data collection

Pages D-4 and D-8 The Fish Assemblage Study uses data collected in 2003 that is over 20 years old. American Rivers v. Federal Energy Regulatory Commission (American Rivers III), ELR Citation: 48 ELR 20113, No(s). 16-1195 (D.C. Cir. Jul 6, 2018), page 29 established a decade as a reasonable study period of usefulness. Fresh data is needed to confirm the presence of native fish as required by MDEP.

Page D-71 It is also significant that the habitat created by releasing water through the sluiceway from July 1 to September 30 uses the warmest water in the Ripogenus - Chesuncook Impoundment. This appear to be attracting fall fish rather than the landlocked salmon and brook trout that it was designed to provide a fishery for - orange highlighting provided for clarity.

**Table 29 Fish collected in the Upper Gorge (All Methods)**

| Species | No. Captured | Percent of Total |
|---|---|---|
| Fallfish | 24 | 34.3% |
| Blacknose Dace | 15 | 21.4% |
| White Sucker | 12 | 17.1% |
| Landlocked Salmon | 11 | 15.7% |
| Slimy Sculpin | 4 | 5.7% |
| Creek Chub | 2 | 2.9% |
| Brook Trout | 1 | 1.4% |
| Yellow Perch | 1 | 1.4% |
| **Total** | **70** | **100.0%** |

D-107 Lake trout, lake whitefish and American eel were not sampled in 2022.

Scale samples and fish metrics were not taken.

# Appendix E

**Fish Stranding Study**

**General Comments**

**The study results contained in the ISR showed significant mortality, especially to landlocked salmon parr. These results were quite similar to the observations of the five teams of TU observers who were in the field during the drawdown.** Strandings and mortality were likely undercounted by the report because a high stranding area in the center of Big A Falls documented by TU volunteers was not covered by Brookfield. ISR Figure 7, page E-33]. The study demonstrates that the minimum flows for trip events were not determined by science.

Moreira et. al. 2019 worked to develop an ecologically based criteria for hydropeaking mitigation. They conclude "Hydropeaking causes severe changes in riverine environments, entailing adverse responses of organisms" (Miguel Moreira, Daniel S. Hayes, Isabel Boavida, Martin Schletterer, Stefan Schmutz, António Pinheiro, 2018, Ecologically-based criteria for hydropeaking mitigation: A review, *Science of the Total Environment*). This underlines the need for a ramping study to determine a ramping rate that minimizes stranding for fish in the river. When it filed its report to the FERC docket, [TU letter dated October 19, 2022, Subject: Report of Observations on Ripogenus Project Fish Stranding Study] TU included this request: "The Initial Study Report from Brookfield is not due until May 13, 2023.[1] We trust that it will be consistent with our observations, and if it does not include empirical data indicating flows and duration of dewatering required to prevent future mass strandings, that Brookfield will propose additional studies to determine that." Since Brookfield has not proposed a follow-on study. **TU urges the Commission to approve a Ramping Study to determine the flow parameters that will greatly reduce or eliminate strandings and resultant mortality**.

**Specific Comments**

Brookfield states that "The early October time frame was selected for the study because it represented a biologically active period for salmonids and other species but was outside the fishing and peak whitewater rafting seasons, thus minimizing conflict with recreational activities. The early October date was also before the onset of the salmonid spawning season, so it did not adversely affect spawning landlocked salmon." Please note that this was **during a very benign period of weather conditions minimizing stranding mortality**. While little macroinvertebrate mortality was observed, it would have been increased if the low flows happened during the hot summer thunderstorm conditions and the cold winter conditions that come with Northeast storms that often cause trip events.

Brookfield states: "During the October 5, 2022 simulation, TU organized and conducted a separate fish stranding monitoring effort using several volunteers to monitor the West Branch." Please note that five two-person teams participated in the coordinated monitoring effort.

Page E-2 "In February 2018, GLHA implemented the procedure for minimum flows during unplanned outages. The change in operations was implemented after GLHA determined that operational procedures relying on spinning the turbines instead of braking was more effective and provided outage flows of at least 400 cfs." This is deceptive - the 400 cfs minimum during generator trip events has been in place since 2017. Brookfield developed an improved method of implementing McKay Stations

response to a trip event after experiencing the outage that occurred on August 13, 2015 when system failure resulted in outage flows of only 342 cfs versus the required 400 cfs. [Brookfield letter dated August 24, 2015, RE Ripogenus Project 2572; Article 402 Compliance; Penobscot Mills Project; Article 403 Compliance; Flow Excursions due to Transmission Line Trip and Station Outages]

Page E-5 "Weather conditions during the stranding study were clear and cool, with an air temperature of approximately 35 degrees Fahrenheit (°F) at the start of the day, warming to approximately 60 °F at the study termination." Please note these are relatively benign conditions that worked to minimize mortality for fish and especially macro-invertebrates.

Page E-7 Table 2 please note prior comments. The conditions on March 14, 2018 and August 30, 2021 would not likely have been so conducive to the survival of stranded fish and macro-invertebrates, orange highlighting supplied.

**Table 2. Summary of Unplanned Station Outages at McKay Station from 2018 to 2022**

| Date | Start Time | End Time/ Flow Restored | Root Cause | Duration (hours) |
|---|---|---|---|---|
| 3/14/2018 | 2:43 AM | 6:13 AM | Wind Storm | 3.5 |
| 7/18/2018 | 10:49 AM | 12:10 PM | Broken Cross Arm | 1.4 |
| 9/30/2020 | 11:05 AM | 4:27 PM | Wind Storm | 5.4 |
| 8/30/2021 | 12:04 PM | 3:15 PM | Lightning Strike | 3.2 |
| 9/16/2021 | 7:32 AM | 10:00 AM | Versant Line 62 outage | 2.5 |
| **Average Duration of Station Trips** | | | | **3.2** |

Page E-8 Table 3 is deceptive. The photos provided with the TU report show the large areas the change in flows created. We also question the actual water level drops. TU observers saw that new areas were still being exposed over two hours after the flow was reduced in the Cribworks area below Telos Bridge highlighted in orange below. TU challenges that "much of the main river channel remained inundated at the low flow condition." This is reflected both later in the Brookfield report and in the TU report by the large number of strandings and significant mortality, even under relatively benign weather conditions. Brookfield provided photos selectively: areas poorly channelized or large deep pools.

**Table 3. Changes in Water Surface Elevation Observed during the Stranding Study***

| Site / Stream Reach | Elevation (ft) on Staff Gage at Start (2,200 cfs) | Elevation (ft) on Staff Gage at Low Flow (510 cfs) | Change in Elevation (ft) |
|---|---|---|---|
| Holbrook Side Channel | 16.4 | 16.4 | 0.0 |
| West Branch at Telos Bridge | 24.8 | 21.4 | 3.4 |
| West Branch at Big Eddy | 23.8 | 21.7 | 2.1 |
| West Branch at Little A | 23.6 | 21.8 | 1.8 |
| West Branch at Nesowadnehunk Deadwater | 2.8 | 1.4 | 1.4 |

*Measurements were of relative water surface elevation at each location; measurements at each location were not related to one another or to any known point of elevation.

TU photo from near the Holbrook side channel



TU photo from the Cribworks area, where only about one third of the bankfull wetted area remained watered. **The rocks shown are watered under nominal 2000 cfs flows, the drop in elevation is clearly more than the 3.4 feet reported in Table 3.**



Major dewatering also occurred at Little A Falls



And at Big A Falls



Page E-9 The ISR goes on to say that “Areas of boulder and cobble bars, bedrock ledges, and fine substrates (e.g., sand and silts) were exposed at the low flow (510 cfs) condition throughout the study reaches; however, much of the main river channel remained inundated at the low flow condition.” This is immaterial given the large dewatered areas and observed strandings and mortality. Brookfield’s own photos document extensive dewatering: Photo 9 [ISR page E-15], Photo 10 and Photo 11 [ISR page E-16], Photo 13 and Photo 14 [ISR, page E-19], Photo 19 and Photo 20 [ISR page E-24], Photo 28 [ISR, page 32], Photo 30 [ISR, page E-35], and Photo 32 [ISR, page E-36].

Page E-33 **Area not covered at Big A Falls** (orange highlighting supplied) noted as high stranding area in TU report [TU letter dated October 19, 2022, Subject: Report of Observations on Ripogenus Project Fish Stranding Study, Attachment M, page 31.] **likely resulted in undercounting.**

**Figure 7. Summary of Observed Fish and Macroinvertebrate Strandings – Big A Falls Reach, October 5, 2022**



E-38 Brookfield summarized that “Stranded fish were observed throughout seven distinct reaches of the West Branch between McKay Station and the Nesowadnehunk Deadwater. Approximately 450 stranded fish were observed during the study, representing nine species: landlocked salmon, brook trout, slimy sculpin, blacknose dace, common shiner, white sucker, fallfish, yellow perch, and banded killifish. Most stranded fish were young-of-year landlocked salmon (55 percent) followed by blacknose dace (31%) and banded killifish (5%) (Table 4). Of the stranded fish observed, approximately half were classified as mortalities. Most stranded fish were small bodied species and lifestages such as juvenile landlocked salmon, dace, and sculpin. No observations of large adult landlocked salmon or adult brook trout occurred.”

TU documented one adult landlocked salmon at Big A Falls and another large fish also being consumed by a merganser in the Holbrook area. It can be reasonably assumed that there were others.





**Ramping Study**

A Ramping Study would inform the project participants by determining minimum flow changes protective of fish and aquatic communities. The Licensee presently ramps flows below the Caucomgomoc and Brassua Lake Dams. Ramping is commonly requirement in FERC Licensed projects.

**Additional Study Request**

In accordance with 18 CFR 5.15(e), the following is submitted to justify the request.

(1) *Any material changes in the law or regulations applicable to the information request*: there have been no material changes in the law or regulations applicable to this request.

(2) *Why the goals and objectives of any approved study could not be met with the approved study methodology*: No approved study addressed the minimum flows that would preclude or minimize strandings or the rates of achieving those flows that preclude or minimize mortality. TU supported a Ramping Study in its Proposed Study Plan Comments. Information on adequate flows or alternative means of project operations such as ramping to prevent this mortality was not contained in any of the studies included in the ISR.

(3) *Why the request was not made earlier.* Such a study was proposed as a Pre-application Document Comment [Ed Spear letter dated February 12, 2022, Subject: A study Request; Ramping and the Need to Determine the Appropriate Rate of Flow Change Below McKay Station on the West Branch of the Penobscot River] but was not included in the studies FERC approved in its Study Plan Determination (SPD)[ FERC Study Plan Determination for the Ripogenus Hydroelectric Project and the Penobscot Mills Hydroelectric Project dated May 13, 2022, page A-1].

(4) *Significant changes in the project proposal or that significant new information material to the study objectives has become available:*.. The Licensee stated there have been no change in Project operations. This is incorrect. Project operations have changed from relatively base flow for papermaking to a market driven peaking regime. Stranding Study decisively demonstrated that permitted project operations allow abrupt changes in flow that result in significant strandings of fish and macroinvertebrates with significant mortality noted, especially to landlocked salmon parr. This conclusively demonstrated the need for a Ramping Study to determine environmentally safe flows changes and the ramping rates needed to achieve them.

(5) *Why the new study request satisfies the study criteria in § 5.9(b):* The following resubmits the ramping study request in accordance with § 5.9(b).

*1. Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of the study is to determine safe ramping rates as well as minimum safe flows and the ramping rates needed to achieve them.

2*. If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Ramping rate studies are a recognized way to determine ramping rates that reduce or eliminate resultant mortality. Brookfield is well aware of such studies from a multi-year study on ramping effects for the Magpie River Project in Wawa, Ontario since the project is operated by a Brookfield subsidiary. The study is described by Karen E. Smokorowski, Robert A. Metcalfe, Nicholas E. Jones, Jerome Marty, Shilei Niu, and Richard S. Pyrce. Studying Ramp Rate Restrictions, Hydro Review, July 2009.

*3. If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study*.

TU members fish the West Branch of the Penobscot regularly. For many of our members, this is one of our most favored fishing destinations, one that we endeavor to revisit every year. TU has a strong and continuing interest in the terms of the relicensing of the West Branch projects. TU's fisheries interests parallel the general public interest.

4*. Describe existing information concerning the subject of the study proposal, and the need for additional information*.

The Stranding Study demonstrated that an abrupt change from flows of about 2000 cfs to trip event flows of 500 cfs caused significant strandings and mortality, primarily to landlocked salmon parr. The Stranding Study identified areas where dewatering, stranding and mortality occurred. This information can be used to position observers for the ramping study. As stated in the SPD: "As discussed in our recommendations regarding Study 5, the Fish Stranding Study, rapid changes in flow and decreases in water surface elevations can increase the risk of fish and invertebrate stranding that can be stressful and/or lethal for aquatic organisms. As indicated by GLHA, the proposed Historical Operations Data Assessment, would provide information on how the Ripogenus Project is operated, including flows provided by McKay Station. However, it is unclear how this study would determine whether the current rate of downstream flow changes adversely affects aquatic resources or how it would determine the rate at which flows from McKay Station can be ramped up or down to minimize the effects of project operations on aquatic resources." There is no empirical data in the record that documents safe flow change for the Ripogenus Project or the ramping rates needed to achieve them.

*5. Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements*.

Changes in the manner in which flow changes are implemented and the limits on them are needed to improve protection of fish and aquatic communities. Results of the study would directly inform development of terms and conditions of a new license to prevent flow changes at rates that would cause dewatering, stranding and mortality.

6. *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate filed season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

Methodology for ramping studies is well documented in Magpie River Ramping Rate Study, Experiment Design, Fisheries and Oceans Canada (DFO), Great Lakes Laboratory for Fisheries and Aquatic Sciences, Sault Ste. Marie. Ontario Ministry of Natural Resources (OMNR)
Great Lakes Power Ltd. (GLPL) July 11, 2002.

The study should be conducted in early October before the effective date of spawning flow restrictions: October 15.

Nominal whitewater flows of 2000 to 2400 cfs should be in effect for a week prior to the study event(s).

Suggested range of flows: 3600 cfs (hydraulic limit) to 500 cfs (trip event flow).

If strandings occurs at the initial rate chosen for the study, result in strandings, the ramping would be repeated on subsequent days at lesser ramping rates until a safe ramping rate was found.

The proposed study methodology is consistent with current practice and consistent with the values of the Penobscot Indian Nation.

7. *Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs*.

Estimated cost is $25,000, consistent with a project of this size and importance. The stranding Study conducted by Brookfield did not meet information ramping goals and are inadequate to inform improved terms and conditions.

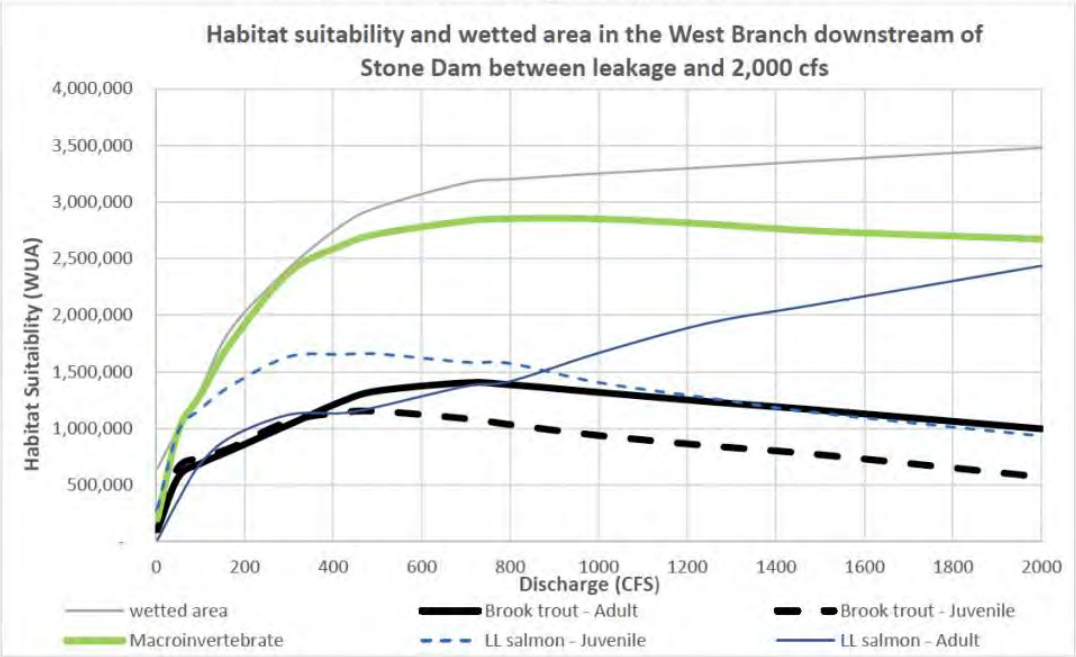
# Appendix F

**Comments**

**Instream Flow and Habitat Assessment of West Branch Downstream of Stone Dam Study**

Page F-11 Figure 2 below shows best suitability for adult brook trout and landlocked salmon between 700 cfs and 1000 cfs. Wetted area curve begins to flatten out at those flows. This is an excellent range for macro-invertebrate life.

**Figure 2. Habitat suitability and wetted area in the West Branch downstream of Stone Dam between leakage and 2,000 cfs.**




Consulting StreamStats, the drainage area above Stone Dam is 1894 sq/mi and the mean August baseflow cfs/mi2 is .46. This results in a minimum flow of 871 cfs, slightly above the middle of the range.

The Water Quality Study showed that the area below Stone Dam did not meet standards for macro-invertebrates: “The rock basket samplers installed downstream of Stone Dam for a 29-day period beginning on July 20, 2022, did not meet MDEP criteria specifying that an average of 50 specimens across the three replicates be collected to evaluate attainment.” [ISR, page C-81]

The Water Quality Study also showed high water temperatures (exceeding 27 degrees Celsius) below Stone Dam for the period of July 28 to August 8 occurring below Stone Dam. [ISR, page C-187]

700 cfs to 1000 cfs would also provide cooler, better oxygenated water, allow for whitewater use, and improved aesthetics. For the Turners Falls Project, (P-1889) on the Connecticut River, FirstLight conducted a 'persistent' habitat analysis that examined habitat that persists throughout a range of operational flows (Accession Number 20170501-5352). It seems reasonable that Brookfield should be able to do a similar study.

**TU strongly supports a wadability study to determine how best to optimize the area for wade fishing, and additional whitewater studies to determine the best whitewater flows.**

# Appendix G

**North Twin Impoundment Tributary Access Survey Study**

**Comments**

Page G-17 “The combination of atypical, high impoundment levels and high stream discharges created circumstances that prevented potential instream barriers from being adequately detected or surveyed. The protracted period of unseasonably warm weather also delayed and/or altered spawning behavior of salmon to the extent that it was not feasible to document evidence of spawning (Kevin Dunham, MDIFW, personal communication). Therefore, GLHA anticipates completing this survey during the 2023 field season.”

It was noted during the ISR Meeting that **the report omitted survey data collected in the impoundment itself in the vicinity of the tributaries. TU strongly requests that this data be included with the Updated Study Report.**

**TU strongly recommends that this year’s study includes the use of radio tags.** Recent spawning studies conducted incident to the ongoing Aziscohos Project (P-4026) relicensing demonstrated the importance of radio-tracking in these studies when year-one studies could not determine where spawning was occurring. Radio-tracking is technology is best science available, the standard for FERC directed studies.

# Appendix H

**Upstream Eel Passage Assessment Study**

**Comments**

Page H-15 It was significant that "between June 7 and October 17, 2022, biologists observed a total of approximately 556 juvenile eels at the East Millinocket Dam during the monitoring period."

Page H-19 It was significant that American eels were by far the most numerous species captured by electrofishing downstream of East Millinocket Stream. See table 3 below, orange highlighting supplied.

**Table 3. Fish Species Documented Downstream of the East Millinocket Development during Boat Electrofishing Surveys, June – October 2022**

| Species | Jun 29 | Jul 20 | Aug 24 | Sep 21 | Oct 10 | Total Catch per Species | Percent of Catch per Species |
|---|---|---|---|---|---|---|---|
| American eel | 93 | 53 | 3 | 2 | 2 | 153 | 44.7% |
| Smallmouth bass | 21 | 23 | 10 | 11 | 30 | 95 | 27.8% |
| Redbreast sunfish | 8 | 8 | 5 | 10 | 16 | 47 | 13.7% |
| White perch | 1 | 8 | 4 | 3 | 0 | 16 | 4.7% |
| Fallfish | 0 | 8 | 1 | 2 | 0 | 11 | 3.2% |
| Pumpkinseed | 0 | 0 | 2 | 0 | 9 | 11 | 3.2% |
| Yellow perch | 4 | 0 | 1 | 1 | 2 | 8 | 2.3% |
| Landlocked salmon | 1 | 0 | 0 | 0 | 0 | 1 | 0.3% |
| **Monthly Total** | **128** | **100** | **26** | **29** | **59** | **342** | **100.0%** |

H-19 "No eels were collected during 1 month of trapping; therefore, trapping was discontinued on July 28.

**TU understands that Brookfield will conduct nighttime eel studies upstream at the dams in the Penobscot Mills projects this summer - TU supports this.**

# Appendix I

**Desktop Downstream Eel Passage Route and Survival Study**

**Comments**

**Table 37. Estimates of American eel cumulative passage success from potential outmigration locations within the Ripogenus and Penobscot Mills Project areas under a 50% outflow exceedance condition**

| Potential Outmigration Source | Project-Development Survival | | | | | Cumulative Survival |
|---|---|---|---|---|---|---|
| | Ripogenus | North Twin | Millinocket | Dolby | East Millinocket | |
| Ripogenus Impoundment | 62.9% | 53.6% | 62.1% | 49.0% | 62.1% | 6.4% |
| Upper Gorge, West Branch downstream of McKay Station, Ambajejus Lake, Pemadumcook Lake, North Twin Lake, South Twin Lake | - | 53.6% | 62.1% | 49.0% | 62.1% | 10.1% |
| Quakish Lake, Ferguson Pond | - | - | 62.1% | 49.0% | 62.1% | 18.9% |
| Millinocket Lake, West Branch downstream of Stone Dam, Shad Pond, Dolby Pond | - | - | - | 49.0% | 62.1% | 30.4% |
| West Branch between Dolby dam and East Millinocket dam | - | - | - | - | 62.1% | 62.1% |

Page I-71 **Table 37 shows 6% cumulative survival for eels starting downstream above Ripogenus Dam (highlighted). This is abysmal.**

TU looks forward to a MDMR filing that will suggest changes to trash rack spacing and other measures.

It should be noted that past fish assemblage reports have shown the presence of adult eels in the system. This photo documents one. [Midwest Biodiversity Institute Development of Methods and Designs for the Assessment of the Fish Assemblages of Non-Wadeable Rivers in New England dated December 31, 2015, page A-7}



# Appendix J

**Terrestrial, Wildlife, and Botanical Resources Study**

TU has no comment.

# Appendix K

**Riparian and Littoral Habitat Assessment Study**

**Comments**

Page K-16 North Twin, dewatered area exposed more than 75 per cent of the littoral zone:

> "The minimum elevation of the impoundment during the low water year (2021) was 482.80 feet, which is approximately 9.12 feet below the normal full pond elevation of the impoundment. At this elevation, approximately 4,921 acres were exposed, which is approximately 26 percent of the total surface area of the impoundment. This is similar to the amount of exposed area under the 11-year average annual minimum elevation at the Project (482.26 feet), which resulted in approximately 5,081 acres of exposed area and equates to approximately 27 percent of the total surface area of the impoundment."

# Appendix L

**Loon Management Plan Assessment Study**

**Comments**

The effects on nesting loons in the impoundment were significant: nesting platforms not used from 2002 to 2010 at most sites. No data from 2010 on. Brookfield says observations were made but not recorded.

No active management program evident.

Lake levels needed for successful loon nesting has not occurred 3 out of the last 11 years.

# Appendix M

**Marsh Bird Survey Study**

TU has no comment.

# Appendix N

**Furbearer Survey Study**

Study is on-going; report to be provided in the Updated Study Report. Accordingly, TU has no comments.

# Appendix O

**Wood Turtle Habitat and Presence Study**

TU has no comment.

# Appendix P

### Recreation Study

### General Comments

A relatively low number of survey forms were completed. FERC recommended use of interviewers.

Further recreational studies must include interviewers in the field. See page P-118 and subsequent.

The recreation season extends through September and studies should reflect this.

### Specific Comments

Page P-126 Survey counts:

**Table 5.14 Counts of Recreation Activities at the McKay Station Rafting Put-in.**

| Activity | Spring (Apr-May) | Summer (Jun-Aug) | Fall (Sep-Nov) | Winter (Dec-Mar) | Total |
|---|---|---|---|---|---|
| Birding | 0 | 2 | 0 | 0 | 2 |
| Power Boat* | 0 | 0 | 1 | 0 | 1 |
| Jet Ski* | 0 | 1 | 0 | 0 | 1 |
| Camp* | 1 | 6 | 3 | 0 | 10 |
| Canoe/Kayak | 7 | 13 | 7 | 3 | 30 |
| Drive for Pleasure | 4 | 8 | 5 | 3 | 20 |
| Educational Program | 1 | 1 | 1 | 0 | 3 |
| Fish from Boat | 2 | 6 | 5 | 0 | 13 |
| Fish from Shore | 4 | 14 | 8 | 0 | 26 |
| Hike | 6 | 12 | 9 | 5 | 32 |
| Cross Country Ski | 0 | 0 | 0 | 2 | 2 |
| Snowshoe | 0 | 0 | 0 | 1 | 1 |
| Nature Observation | 2 | 7 | 4 | 2 | 15 |
| Paddleboard | 2 | 4 | 2 | 1 | 9 |
| Photography | 3 | 7 | 5 | 2 | 17 |
| Picnic | 2 | 6 | 6 | 0 | 14 |
| Scenic Viewing | 6 | 10 | 8 | 3 | 27 |
| Sightsee | 3 | 6 | 6 | 1 | 16 |
| Sunbath | 1 | 4 | 3 | 0 | 8 |
| Swim | 1 | 7 | 5 | 0 | 13 |
| Walk | 1 | 6 | 4 | 0 | 11 |
| Whitewater Boating** | 12 | 17 | 13 | 4 | 46 |

*This is how the information was provided on the survey form, but there are no powerboating, jet-skiing, or camping opportunities at McKay Station. Swimming is not authorized near McKay Station. Paddleboarding opportunities are limited to the same whitewater reach used by whitewater boaters.
** Note, the survey did not distinguish between rafting and other types of whitewater boating (kayak, canoe, etc.).

Highlighted fishing survey numbers are inadequate to assess use. Numbers describing use of the Gorge Trail are deceptive. “Uriah Forest-Bulley (KA) said the users at the Upper Gorge Trail included people who drove to that parking area, enjoyed the views from the dam, and then left, so some users only used the parking area but not the trail.” [ISR Meeting Report, page 15]. Other survey counts were inadequate as well.

Page P-51 and subsequent. The number of fisheries surveys received was insufficient, especially when compared to creel surveys accomplished for the last relicensings. [Ripogenus Project Application for New License dated December 1991, Volume X, Appendix C].

Page P-152 and P-153 Fisheries data was inadequate, example for page 152: Although the area below McKay Station to Nesowadnehunk is fished heavily, a total of only 14 fish were included.

**Table 5.44 Species of fish caught and size information from respondents at the Ripogenus Project recreation sites.**

| Species of Fish Caught | Fish Size Information | Count |
|---|---|---|
| *Upper Gorge Trail* | | |
| Landlocked Salmon | All fish were released | 1 |
| | | |
| *McKay Station Rafting Put-in* | | |
| Salmon, brook trout, yellow perch, fallfish | None kept. 6-9" brook trout. 8-18" salmon | 1 |
| N/A/none | None | 2 |
| Landlocked salmon, brook trout, chub | None kept, 15” | 1 |
| Landlocked Salmon | None kept, 25 between 8” and 18” | 1 |
| Landlocked Salmon | None kept, about 11 inches | 1 |
| Brook trout, landlocked salmon | None kept | 3 |
| Brook trout, landlocked salmon | All fish were released | 1 |
| Brook trout, landlocked salmon | 15 inches, 1lb | 1 |
| Brook trout, landlocked salmon | None kept, 8 to 18 inches | 1 |
| Trout | None kept, 5 10-18" | 1 |
| | | |

**Repeating a passive survey will likely result in the same outcomes. TU request that a new Creel Survey with active interviewers in the field to collect data comparable to that submitted with the last relicensing. An additional study request is included at the end of this appendix.**

Area below Stone Dam - watering below dam and access are issues. To access the river below Stone Dam during overflow conditions, paddlers must row about a mile to get to the dam. There is a road that extends nearly to the dam, but a locked gate precludes access.

**TU supports the contention that boating flow studies are needed below Stone Dam and suggests that they be combined with wadability studies.**

**TU Supports Boat Access Studies at Stone Dam - Chesuncook and Ripogenus Gorge as** well.

Millinocket Stream has recreational interest and additional whitewater potential.

**Additional Study Request: Creel Survey**

The Study Plan Determination stated:

"In order to partially address the request from Edward Spear to conduct a Creel Survey (see Part II – Studies Not Required) and his comments on the RSP, the Recreation Study could also be modified to collect some basic information about the recreational fishery through additional questions on the recreation user surveys. Because adding questions to the recreation survey would require less effort than conducting a separate creel survey [section 5.9(b)(7)], we recommend modifying the survey instrument to include a section of angler-specific questions (e.g., if the user is there to fish, what species are they targeting, how long did they spend fishing/length of trip, what species did they catch, how many fish were kept, approximate size, etc.)." [SPD, page B-41]

The ISR included a very limited amount of fisheries data in the Recreation Study Report and this was not supported by any interviews as FERC Staff had requested. "Dustin Wilson (FERC) said stakeholders recommended qualitative interviews, and FERC's SPD recommended interviews with users or working groups; however, FERC did not see this reflected in the study report." [ISR Meeting Summary, page 17] More information is required and the lack of success using passive survey methods is a clear indication that putting surveyors in the field is necessary to be able to make any reasonable assessment of the state of the fishery. Creel surveys were conducted incident to the last relicensing and the proposed survey would provide better data for comparison.

A Creel Survey was requested by Mr. Ed Spear incident to the Pre-application Document Comments in his letter dated February 12, 2022 but was not included in the studies FERC approved in its Study Plan Determination (SPD). The following request borrows from the previous filing.

In accordance with 18 CFR 5.15(e), the following is submitted to justify the request.

(1) *Any material changes in the law or regulations applicable to the information request:*
there have been no material changes in the law or regulations applicable to this request.

(2) *Why the goals and objectives of any approved study could not be met with the approved study methodology:* Anglers did not respond to the passive survey and the applicant did not use interviewers in the field as FERC had requested.

(3) *Why the request was not made earlier*. The request for a creel survey was made as a Pre-application Document comment request by Mr. Spear but not included as an approved study in the Study Plan Determination.

(4) *Significant changes in the project proposal or that significant new information material to the study objectives has become available*: The dearth of information contained in the Recreation Report requires a different approach. Peaking operations occurring below Ripogenus that TU cited in Appendix A of this filing demonstrate that a change in project operations has occurred making determination of its effects

important to this relicensing. As TU states in Appendix C of this filing, the Fish Assemblage Study used some data over 20 years old. Considered as a whole, the state of the fishery remains under-informed; compared to the fisheries information contained in the last license application, the current relicensing is woefully uninformed after the completion of year-one studies.

(5) *Why the new study request satisfies the study criteria in § 5.9(b):* The Creel Survey Study Request that follows meets § 5.9(b) requirements.

**Creel Survey Study Request**

Study Request: A creel survey to determine daily and annual West Branch of the Penobscot River angler use, effort, catch, method (drift boat, watercraft, wading, etc.) and (riverine) location of anglers fishing between Ripogenus Dam and the base of Pockwockamus Falls.

*1.Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of the proposed study is to record existing West Branch angler use (date, time, location(s) fished and terminal gear), and catch (species, size and number). Angler use and catch presented by the applicant in the riverine areas below Ripogenus Dam is outdated. Current (daily/annual) angler use and catch needs to be enumerated and subsequently evaluated.

The last license application stated: "The salmon fishery of the West Branch has changed and grown significantly over a long period of time in response to improvements in flow and access resulting from hydroelectric developments. It is now recognized to be one of the premier salmon fisheries in the world." Ripogenus Project Application for New License dated December 1991, Volume IX, page 63]. Anecdotal information from TU members, Maine guides, and others who fish to West Branch question if this is still the case.

In order to compare (1980s) baseline conditions described in the 1991 License Application and the 1992 EIS, at least 2024 angler use and catch information beyond what the year-one study provided is necessary. In addition to providing critical fisheries information to all interested parties, a creel survey will meet goals described in the (draft) Maine Department of Inland Fisheries and Wildlife (MDIFW) Plan. In regard to Landlocked Atlantic Salmon (salmon), these goals include;

> Advocating for in-watershed land and water management practices that maintain or enhance spawning and rearing habitats for wild populations, where populations are not overabundant
>
> Continue current monitoring and assessment to be responsive to changes in abundance and condition over time
>
> **Reevaluate salmon waters that haven't been recently assessed to ensure existing regulations reflect current management goals and angler behavior**. (emphasis added**).**

2*. If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

A creel survey is a standard method for determining angler use and catch from one or more waters. Typically, a clerk, either stationary or mobile, counts and when possible, interviews anglers during

predetermined dates and times. On-site counts (and interviews) are more practical and robust than other possible methods such as aerial, on-site volunteer (angler) boxes with "fill-in" forms or "mail-in" surveys that proved inadequate in the year-one recreational study. Creel surveys are commonly used by MDIFW and fisheries agencies nation-wide. Such a study of angler use, catch and effort lays the foundation for future licensing decisions making as well as supporting current/future State of Maine fisheries management goals. MDIFW filed a (draft) FISHERIES STRATEGIC PLAN 2021-2035, Vol I (MDIFW Plan dated November 2, 2021) that listed prioritized fisheries goals. General fisheries goals include "… Maintain healthy fish populations and their habitat. Ensure freshwater fish populations remain healthy and are sustainably managed into the future." In order to obtain the MDIFW Plan's primary goals, a number of secondary actions are required;

"Conserve native fish species, particularly those exhibiting population decline, …"

"Manage for sustainable harvest of sport fish"

"Promote and direct conservation actions, including conservation of riparian habitat, habitat restoration, and habitat connectivity targeting the state's highest priority wild native fisheries". **Brook trout and landlocked salmon are two of the native fish species referenced in the MDIFW's Plan.** (emphasis added).

There is no current, quantifiable West Branch fisheries information upon which fisheries management decisions can be based. A creel survey of the West Branch fisheries (salmon, brook trout) below Ripogenus Dam and extending downstream to Pockwockamus Falls will meet the goals stated above. This request is fully consistent with treaty obligations with the Penobscot Indian Nation to restore a sustenance fishery on the Penobscot.

*3. If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study*.

TU members fish the West Branch of the Penobscot regularly. For many of our members, this is one of our most favored fishing destinations, one that we endeavor to revisit every year. TU has a strong and continuing interest in the terms of the relicensing of the West Branch projects. TU's fisheries interests parallel the general public interest.

4*. Describe existing information concerning the subject of the study proposal, and the need for additional information*.

**The only creel data in the record sampled far too few anglers to be significant.** There is minimal current fisheries information for the WB between Ripogenus Dam and the base of Pockwockamas Falls. Critical data gaps exist for angler use, catch, and (riverine) location and for salmon and brook trout (trout) growth, survival and spawning history.

*5. Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements*.

Since the issuance of the last license, project operations from a relatively stable base flow to a peaking operation. The changes have had negative impacts on angler use and salmon growth, abundance, choice of habitat and movement (personal observations). When compared to the baseline data used in the EIS, 2022-2023 West Branch creel surveys will demonstrate changes in angler use and effort and salmon and trout abundance (catch rates) and to a lesser degree, choice of habitat and movement. The survey should include scale samples and analysis for landlocked salmon and brook trout as was done with the

last relicensing would provide additional information on growth rates and the state of the fishery. [Ripogenus Project Application for New License dated December 1991, Volume X, Appendix C].

6. *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate filed season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

The proposed creel survey should duplicate the study plans using a survey clerk as described in Ripogenus Project Application for New License dated December 1991, Volume X, Appendix C, Maine Department of Inland Fisheries and Wildlife 1986 Chesuncook Lake Progress Report No. 1, Methods paragraph, Summer subparagraph as closely as possible and develop data similar to that reported in Appendix E of the same volume of the license application. The proposed study methodology is consistent with current practice and consistent with the values of the Penobscot Indian Nation.

For the level of information desired, angler surveys should occur:

May and September – four (10h) days, ending at sunset
June -August – four (12h) days, ending a half hour after sunset

Sampling days should be divided between weekdays and weekend/holidays.

The Applicant may have retained a copy of the GNP computer program designed to input daily angler, use, catch and effort based on stratified random sampling. Use of this program would provide for a more valid comparison between the surveys conducted with the last relicensing and the requested survey.

7. *Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs*.

Estimated cost is $35,000, consistent with a project of this size and importance.

The study conducted as part of the year-one recreational studies did not provide enough data to inform the relicensing process.

# Appendix Q

**Whitewater Boating Assessment Study**

**Comments**

Ripogenus Dam

Level 2/3 studies may be needed below Ripogenus Dam.

Millinocket Stream

The Level 1 study was adequate.

Stone Dam

Needs level 2/3 studies.

# Appendix R

**Aesthetics Study**

**Comments**

Less than a typical year, low survey numbers.

Brookfield was required to consult with stakeholders prior to the study and did not do so.

Numbers describing use of the Gorge Trail are deceptive. “Uriah Forest-Bulley (KA) said the users at the Upper Gorge Trail included people who drove to that parking area, enjoyed the views from the dam, and then left, so some users only used the parking area but not the trail.” [ISR Meeting Report, page 15]. TU believe that the trail is underutilized because Maine’s most dramatic gorge is dewatered except for three months out of the year except for leakage or overflow, and then only watered with 100 cfs “fishing flows” that do not materially improve the fishing.

TU strongly supports a controlled study for the gorge to determine aesthetic and whitewater opportunities.

# Appendix S

**Historic Architectural Survey**

TU has no comment.

# Appendix T

**Environmental Justice Study**

**Comments**

The Study Plan Determination included the language: "The Penobscot Indian Nation requests that GLHA form a Socioeconomic Working Group and conduct a Socioeconomics Study to assess existing socioeconomic conditions in the Projects' areas. The Penobscot Indian Nation's study would include an evaluation of existing conditions, including population, housing, economic development, public services, local energy production, and State statutes related to energy production, fiscal conditions, and infrastructure. The requested study would also describe current socioeconomic trends in the Projects' vicinity, and how measures implemented at the Projects may affect these trends. The Penobscot Indian Nation requests that the study be developed with extensive input from stakeholders to determine priorities for the use of resources with the potential to be affected by the project. To support this request, the Penobscot Indian Nation points to changes in the local economy as a result of the operation of the Projects and the associated paper mills, as well as the effects of the Projects on cultural, outdoor, and other economic opportunities in the region." [SPD, page B-47]

It is significant that: "The Penobscot Nation has inhabited the Penobscot River, including the West and East Branches, from time immemorial. This is the Nation's aboriginal domain. The Nation has never ceded its related aboriginal title to the River and its branches in any treaty and Congress has never extinguished that aboriginal title. It is the Nation's position that Ripogenus and the Penobscot Mills Projects, located on the West Branch of the Penobscot River, occupy federal lands, the Penobscot Reservation." [PIN Pre-application Document Comments dated October 12, 2021, page 1].

The Study Plan Determination approved the PIN request with modifications [SPD, page A-3] by directing a Socioeconomic Study/Environmental Justice Analysis [SPD, page B-47 and subsequent]. The PIN filing had gone on to say: "The PIN also has concerns of Environmental Justice surround the continued operation of the projects, as they may disproportionately affect minority and low-income people living in the region. The PIN asks that FERC staff provide guidance to the stakeholder as to the environmental justice concerns at the project, any recent changes in the FERC NEPA analysis that may or may not include sections on environmental justice, and how they could be related to these projects. [PIN PAD Comments, page 2].

Page T-1 Brookfield neglected to include this information in paragraph 1.2. Background.

Page T-2 Brookfield took the narrowest possible interpretation of the Study Plan Determination "As required in the May 13, 2022 SPD, the study area is defined as the geographic area within 1 mile of the FERC Project boundaries for the Ripogenus and Penobscot Mills Projects." The study then only considered communities physically located within the project area, essentially the shores of the West Branch of the Penobscot between the Ripogenus and Penobscot Mills projects and their impoundments. Limiting the scope to this narrow interpretation rather than to the communities that are impacted by what occurs in this area thwarted the intent of the PIN and the SPD.

**TU asks that FERC direct accomplishment of a modified study with clarifying language specifying inclusion of the Penobscot Indian Nation and the effects of mill closures on them in terms of environmental justice. Justification: 18 CFR 5.15(d) paragraphs (c)(1)–(4) "(1) Approved studies were not conducted as provided for in the approved study plan;"**

Christopher Howe, Kingfield, ME.
Ferc comments

My name is Christopher Howe and I'm the river manager for North Country Rivers Penobscot. I have been guiding rafts on the west branch since 2009. I'm an avid user of the waterway and spend more time on the whitewater of the west branch, professionally and recreationally than most users. I as well, have been residing at Big Eddy Campground April to October for the last 10 years.

When it comes to the whitewater boating opportunities between rip dam and McKay station the data presented in Millinocket in early May only covered what the river is like at high flows 2000cfs and above. There was no information presented on what the boating is like at flows between 100cfs and 2000cfs. I find this very concerning because this is the flow range that I believe, based off my 13 years of experience kayaking and rafting in this reach. would make the section of river accessible to the largest group of whitewater boaters. the study reports class IV/V big water conditions at flows 2000cfs and higher, these high flows significantly reduce the number of users comfortable paddling that sort of water. Brookfield has repeatedly stated that this section of river is a dangerous class V torrent that is unsuitable for whitewater recreation. This statement shows a profound lack in truly understanding the boating opportunities below the dam. Basing a comprehensive study off of the number of surveys received is negligible and inadequate. This complete lack of data on the low range of flows between (100cfs-2000cfs) in itself should dictate that a lvl II and III Whitaker study be conducted.

The value of Millinocket Stream cannot be overstated. If flows weren't diverted away from Millinocket Stream it could be utilized by outfitters In Millinocket to facilitate quick half day outings very close to town, which in turn could be lucrative for the outfitter. This stream as well as below Stone Dam, if given proper flows could support the local economy by diversifying options that whitewater guests could choose from. Currently Millinocket outfitters are only able to offer class IV/V rapids for rafting and inflatable kayaking compared to the class II/III rapids of Millinocket stream.

When analyzing the data presented about the dewatered section of the Penobscot below Stone Dam. It does not take a lawyer to know that there is no formal information to work with. What we do know is that there is no direct way for the public to know what water flows are below Stone Dam, and that access to the put in for the river below the dam is closed to the public. The fact that only 2 surveys were completed and 1 YouTube video was presented clearly points that a Whitaker II and III should take place on the Penobscot below stone dam.

The data presented about total users between Rip Dam and Debs Falls is heavily skewed in the negative because the study did not include informal access sites up and down the entire river corridor. These sites are heavily used by a more diverse group, because the informal sites allow access to flatwater, quickwater, and class II, III, IV rapids opposed to the class V rapids directly below McKay Station. I think this study, in order to show true usage of the river, needs to be amended to include all formal and informal access sites from Rip Dam to the Grant Brook Road Bridge.

I personally manage 7 to 8 full time employees at North Country(May-Oct). Our business is located at Big Moose Inn, which in turn brings guests to their cabins,

campground, and restaurants. Big Moose Inn has an even larger staff of house keepers, cooks, bartenders, waitresses, and grounds workers whose jobs could all be in jeopardy if any major changes to the current flow regimen were made.

I can think of 18 businesses that directly generate revenue from current flow regimens below McKay Station, and then numerous more private fishing guides who operate on the river. If you were to include businesses that are indirectly impacted, the list could spread to every summer business in Millinocket. Currently the commercial rafting business brings 5000-7500 people per year when averaged out over the last 10 years. If we look back 30 years in the history of rafting the Penobscot there are periods were the rafting companies drew 20,000-30,000 people of year during the era of the Big A Dam controversy and the paper mill. It would be short sighted for the current regimen to be changed to a point where the river could not support a similar volume of rafters in the future.

Chesuncook Lake is a man made lake created as an impoundment for power generation and should continue to be used as such, especially when foreign power companies are bulldozing the Maine forests to bring in Hydro Power.

Considering the dam was built in 1917, and now we are half way through 2023. this re-licensing should heavily consider the possible impacts of climate change and how that is going to effect water management of Chesuncook Lake in the future, the safety of the residents below, and what measures need to be taken to mitigate the risk of severe flooding or catastrophic failure of this 93 foot tall, 107 year old, concrete and wooden dam that holds back Maines 3rd largest lake.

I’m left wondering if this dam is even capable of surviving until the next relicensing around 2050. Which would leave the dam at 132 years old.

I think we need an integrity study conducted on Brookfield to determine how accurate the flows are presented on their website and why they don’t present historic flow data to the public. A 3rd party river gauge and tracker should by installed by USGS to keep GLHA honest.

I greatly look forward to collaborating with all
Parties involved to come to the most informed, fair, environmentally justified, and profitable solutions to help make room for the Katahdin Region to grow from the glory days of the paper mill over the next 30 years.

Kimberly D. Bose, Secretary
Federal Energy Regulatory
Commission 888 First Street, N.E.
Washington, DC 20426

July 6, 2023

**RE: Comments and Study Requests regarding the Maine Department of Inland Fisheries and Wildlife filing of June 30, 2023 for the Ripogenus Project (FERC No. 2572-133)**

Dear Secretary Bose:

The Maine Department of Inland Fisheries and Wildlife (MeDIFW) comments of June 30, 2023 speak of smelt entrainment as well as a creel survey. The smelt drift phenomena drives the West Branch of the Penobscot salmon fishery issues. However, MeDIFW's June 30. 2023 filing speaks of facts not in evidence. These claims beg further study.

While the 1991 GNP Applications notes an average annual drift of 25,000 pounds there is no evidence that significant West Branch smelt drift is presently occurring. In fact, while MeDIFW "time available" sampling collected a few smelt, data on those catches has not been provided. Recent antidotal information suggests smelt abundance is presently insignificant.

MeDIFW states that "During our May 5, 2023, site visit to the Project with FERC staff, we stopped at the Holbrook Pool area and observed many gulls swooping down to pick up smelt that were drifting downstream from McKay Station". There was no mention of smelt being collected or observed floating downstream.

Heavy rains in August, 2022 resulted in the Ripogenus Impoundment returning to full or near full pond as a result of tributary run-off. The results were stable littoral, epilimnion and metalimnion zones during August and September. These conditions are ideal for Juvenile smelt production. In prior filings the stakeholders have argued for a gradual stable drawdown that would benefit juvenile smelt and zooplankton populations. Possibly, did MeDIFW witness a start of a juvenile smelt recovery?

Alternately, I drove by Holbrook Pool hundreds of times in my studies of the West Branch. Sea gulls are carrion feeders; they are constantly searching for food exiting McKay Station. Smelt can be present but yellow and white perch and minnow species are also entrained and drift though Holbrook Pool. Insects, however, including caddis were more common. The answer to the smelt availability issue is weekly "drift net" sampling.

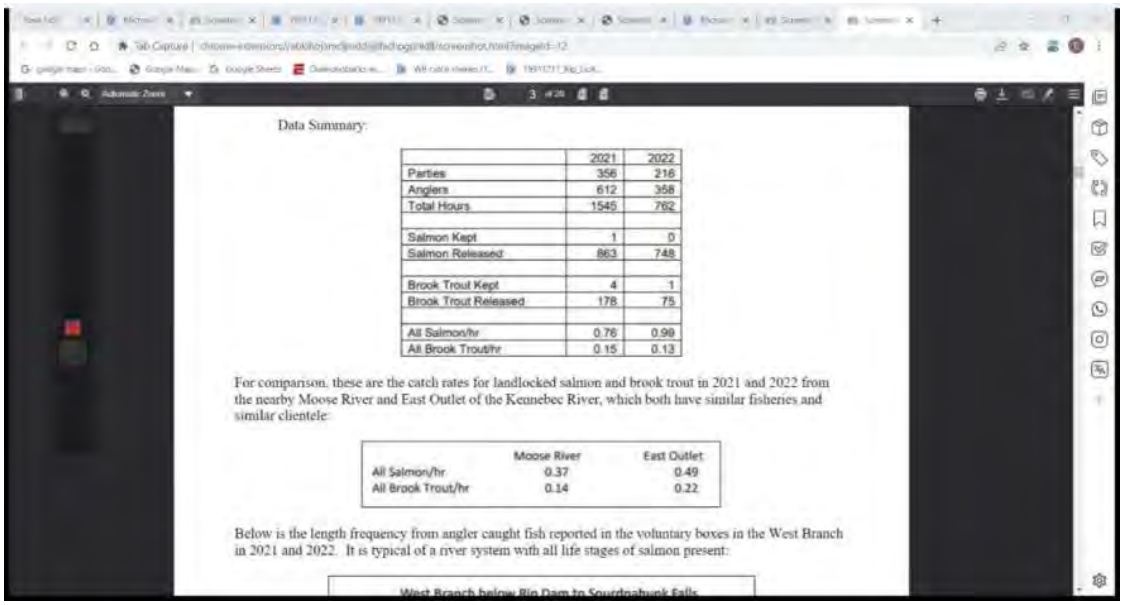
Studies are needed. Smelt are the major component of fisheries issues in this licensing. A few hungry sea gulls hovering over Holbrook Pool cannot be a standard in a 30 year licensing process.

MeDIFW continues with "Studies conducted by Great Northern Paper (1985 - 1989, 1999 – 2001), and by MDIFW (2021) clearly demonstrate that hundreds of thousands of smelt from the Ripogenus Impoundment drift downstream and provide forage for the resident salmon

population". In regard to current smelt abundance, nothing is "clear". The reference to the 2021 MeDIFW smelt collection is a fact not in evidence. Without smelt numbers, length, weight and net sampling efficacies, the time available 2021 studies simply demonstrate MeDIFW's work ethic and commitment to the resource and that smelt were present in some uncalibrated number for a small portion of year. These data are NOT comparable to GNP's year long 1985-1989 and 1991-2001 smelt drift net study results.

MeDIFW explained it's standing on a creel survey request and its evaluation of the present WB fishery. Sadly, MeDIFW IS UNDERFUNDED. Unfortunately, this leads to the use of biased angler survey boxes. As a management tool these data may be satisfactory. In evaluating the existing West Branch salmonid age/growth, distribution, and abundances, MeDIFW` survey boxes fail to provide the needed quantifiable information.

In an attempt to compare riverine fisheries, MeDIFW provided 2021 and 2022 West Branch angler survey box information. This was used in comparison between the East Outlet of Kennebec River, Moose River and West Branch as shown in the below table. Both the East Outlet and Moose River benefit for the Greenville' Region suberb management of the Moosehead salmon fishery. These reaches are popular fisheries, locating a parking spot and place to fish is difficult. The West Branch below McKay is no longer crowded with anglers and the abundance of salmon, legal or sublegal size, unknown.



Data Summary:

| | 2021 | 2022 |
|---|---|---|
| Parties | 356 | 216 |
| Anglers | 612 | 358 |
| Total Hours | 1545 | 762 |
| | | |
| Salmon Kept | 1 | 0 |
| Salmon Released | 863 | 748 |
| | | |
| Brook Trout Kept | 4 | 1 |
| Brook Trout Released | 178 | 75 |
| | | |
| All Salmon/hr | 0.76 | 0.99 |
| All Brook Trout/hr | 0.15 | 0.13 |

For comparison, these are the catch rates for landlocked salmon and brook trout in 2021 and 2022 from the nearby Moose River and East Outlet of the Kennebec River, which both have similar fisheries and similar clientele:

| | Moose River | East Outlet |
|---|---|---|
| All Salmon/hr | 0.37 | 0.49 |
| All Brook Trout/hr | 0.14 | 0.22 |

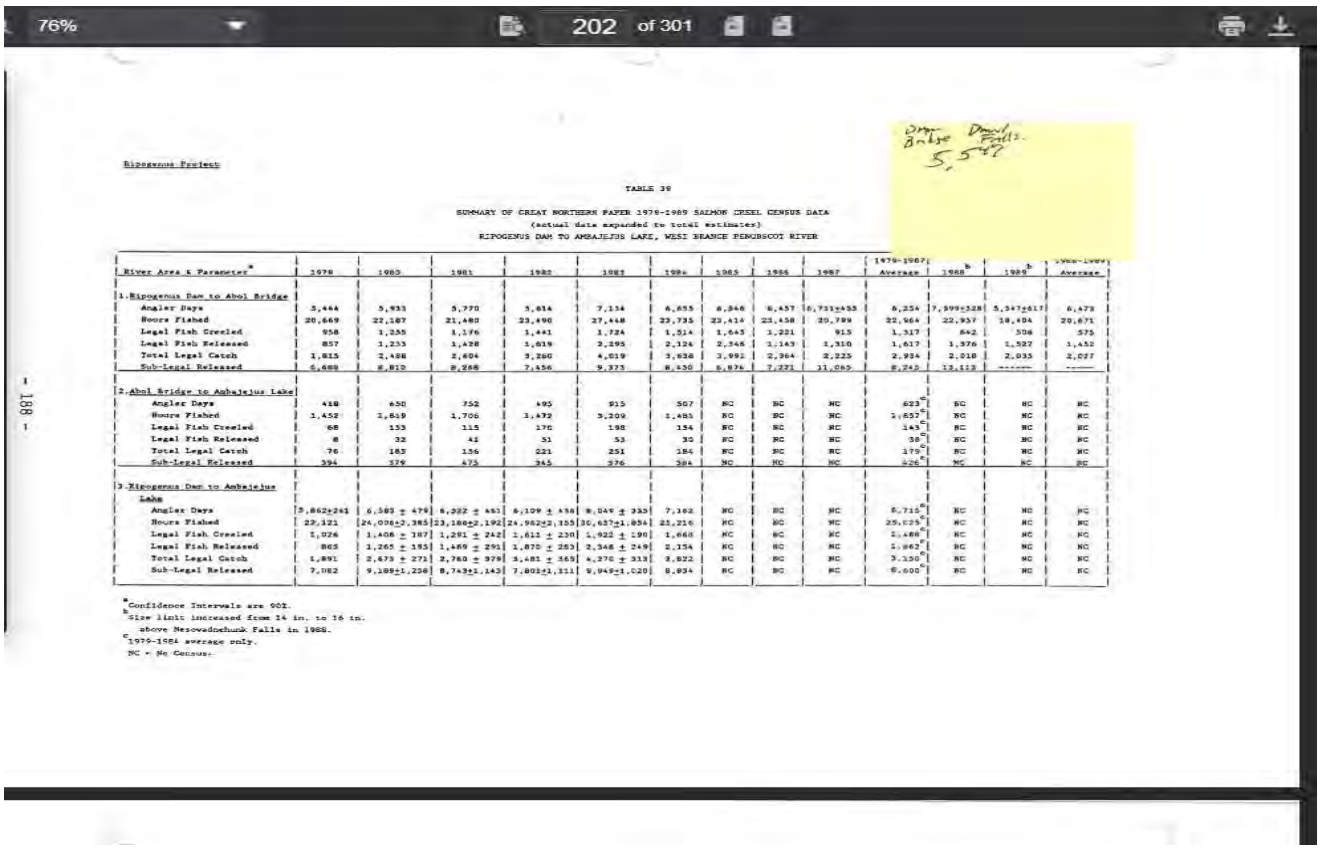
Below is the length frequency from angler caught fish reported in the voluntary boxes in the West Branch in 2021 and 2022. It is typical of a river system with all life stages of salmon present:

West Branch below Rip Dam to Spurdnahunk Falls

MeDIFW's management goals include "satisfying" anglers. Most, is not all, anglers focus on catching larger, legal-size salmon rather than 6-12" subadults. Thus, tabular information that includes "small" salmon is not much of a standard when applied to a 30 year licensing process. Recording sub-legal fish is a normal component of creel surveys. GNP 1979 – 1986 survey generally followed MeDIFW's guidelines. Clerks asked and recorded angler reports of sub-legal

fish released. The table below provides the outdated GNP creel survey results. The average fish per angler was 1.57 salmon a day. This is twice the number of West Branch 2021-2022 survey box fish per day results and provides a clear indication of the decline in the West Branch salmon fishery downstream of McKay Station associated with the change in project operation.

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Ripogenus Project

TABLE 39

SUMMARY OF GREAT NORTHERN PAPER 1979-1989 SALMON CREEL CENSUS DATA
(actual data expanded to total estimates)
RIPOGENUS DAM TO AMBAJEJUS LAKE, WEST BRANCH PENOBSCOT RIVER

| River Area & Parameter[a] | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1979-1987 Average | 1988[b] | 1989[b] | 1988-1989 Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.Ripogenus Dam to Abol Bridge | | | | | | | | | | | | | |
| Angler Days | 5,444 | 5,933 | 5,770 | 5,814 | 7,134 | 6,655 | 6,846 | 6,457 | 6,731±433 | 6,254 | 7,999±328 | 5,347±617 | 6,673 |
| Hours Fished | 20,669 | 22,187 | 21,480 | 23,490 | 27,448 | 23,735 | 23,414 | 23,458 | 29,799 | 22,964 | 22,937 | 18,404 | 20,671 |
| Legal Fish Creeled | 958 | 1,255 | 1,176 | 1,441 | 1,724 | 1,514 | 1,645 | 1,221 | 915 | 1,317 | 842 | 508 | 675 |
| Legal Fish Released | 857 | 1,233 | 1,428 | 1,619 | 2,295 | 2,124 | 2,346 | 1,143 | 1,310 | 1,617 | 1,376 | 1,527 | 1,452 |
| Total Legal Catch | 1,815 | 2,488 | 2,604 | 3,260 | 4,019 | 3,638 | 3,991 | 2,364 | 2,225 | 2,934 | 2,218 | 2,035 | 2,127 |
| Sub-Legal Released | 6,688 | 8,810 | 8,268 | 7,456 | 9,373 | 8,430 | 6,876 | 7,271 | 11,085 | 8,242 | 13,112 | ------ | ------ |
| 2.Abol Bridge to Ambajejus Lake | | | | | | | | | | | | | |
| Angler Days | 418 | 650 | 752 | 495 | 915 | 507 | NC | NC | NC | 623[c] | NC | NC | NC |
| Hours Fished | 1,452 | 1,619 | 1,706 | 1,472 | 3,209 | 1,485 | NC | NC | NC | 1,657[c] | NC | NC | NC |
| Legal Fish Creeled | 68 | 153 | 115 | 176 | 198 | 134 | NC | NC | NC | 143[c] | NC | NC | NC |
| Legal Fish Released | 8 | 32 | 41 | 51 | 53 | 30 | NC | NC | NC | 36[c] | NC | NC | NC |
| Total Legal Catch | 76 | 185 | 156 | 221 | 251 | 164 | NC | NC | NC | 179[c] | NC | NC | NC |
| Sub-Legal Released | 394 | 379 | 472 | 345 | 376 | 384 | NC | NC | NC | 426[c] | NC | NC | NC |
| 3.Ripogenus Dam to Ambajejus Lake | | | | | | | | | | | | | |
| Angler Days | 5,862±241 | 6,583 ± 479 | 6,522 ± 451 | 6,109 ± 436 | 8,049 ± 335 | 7,162 | NC | NC | NC | 8,715[c] | NC | NC | NC |
| Hours Fished | 22,121 | 24,006±2,385 | 23,186±2,192 | 24,962±2,155 | 30,657±1,854 | 25,216 | NC | NC | NC | 25,625[c] | NC | NC | NC |
| Legal Fish Creeled | 1,026 | 1,408 ± 187 | 1,291 ± 242 | 1,611 ± 230 | 1,922 ± 190 | 1,668 | NC | NC | NC | 1,488[c] | NC | NC | NC |
| Legal Fish Released | 865 | 1,265 ± 155 | 1,469 ± 291 | 1,670 ± 283 | 2,348 ± 249 | 2,154 | NC | NC | NC | 1,962[c] | NC | NC | NC |
| Total Legal Catch | 1,891 | 2,673 ± 271 | 2,760 ± 379 | 3,281 ± 369 | 4,270 ± 313 | 3,822 | NC | NC | NC | 3,150[c] | NC | NC | NC |
| Sub-Legal Released | 7,082 | 9,189±1,258 | 8,743±1,143 | 7,803±1,311 | 9,949±1,020 | 8,934 | NC | NC | NC | 8,600[c] | NC | NC | NC |

[a]Confidence Intervals are 90%.
[b]Size limit increased from 14 in. to 16 in. above Nesowadnehunk Falls in 1988.
[c]1979-1984 average only.
NC = No Census.

The above information, including MeDIFW's plea for funding demonstrates the need for a quantitative survey of West Branch anglers and their catch. For obvious reasons MeDIFW does not want a third party involved. I concur.

I ask FERC to require a MeDIFW designed, managed, and staffed creel survey of the West Branch between Ripogenus Dam and Abol Bridge. The Licensee would provide funding. As part of this request, I also ask that the Licensee completely fund an entry level MeDIFW fishery position dedicated to the Ripogenus Impoundment and downstream West Branch. This additional staff member would be part on the Greenville Region staff and supervised by the lead biologist. The current licensing process will last for several years. Validation of mitigation and enhancement measures will last even longer. Requiring the Licensee to fund a MeDIFW West Branch staff member is reasonable as no other entity has riverine creel survey expertise.

Licensee funding of subsequent oversight of future project operations including the upstream Storage Project and its associated fisheries e.g., The Foxhole, is a likely License Article condition.

Any creel survey of the West Branch should be of MeDIFW's design with the caveat that anglers fish late into the evening. These anglers and their catch need to be counted and when possible, interviewed. In an earlier filing on November 9, 2002, I proposed a West Branch of the Penobscot River creel survey of the reach below McKay Station extending to Abol Bridge. This document is attached for the reader's convenience and is a suggestion of study design rather than a demand.

Thank you for the opportunity to comment and for your consideration of the two proposed studies.

Ed Spear
307 Mt Hope Ave.
Bangor, Me 04401
Email: edspear1@yahoo.com
Phone: 207-217-4288



ed's Nov C survey
Rip Study request.pdf

Ms. Kimberly D. Bose July 6, 2023
Secretary,
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426. VIA Electronic Filing

**Reference: Ripogenus Hydroelectric Project (P-2572-133)**

**RE:** A Study Request and Comments on the April 23, 2023 Initial Study Report Appendix D and a request for Rainbow Smelt (Osmerus mordax) studies of their growth, age and abundance in the Ripogenus Impoundment and West Branch of the Penobscot River downstream of McKay Station

Rainbow smelt (smelt) populations of the Ripogenus Impoundment sub basins provide prey as juveniles to salmonids in the Impoundment and downstream West Branch of the Penobscot River (West Branch). Their abundance is the most important fisheries parameter in the licensing of the Ripogenus Project (P - 2572) The Initial Study Report Appendix D (ISR) fails to address United States Fish and Wildlife Service's (FWS) request for rainbow smelt collections during 2022 sampling of the Ripogenus Impoundment and downstream West Branch. Moreover, limited smelt information provided in Appendix D showed an average smelt length typical of older fish which are generally too large for most adult salmon. This is evidence of a smelt population out of balance, "top heavy" with older fish.

My filing of January 27, 2022 requested actions similar to FWS's request. This filing reviews the life history and role of smelt in fisheries of the above referenced project waters. Sampling methods of lacustrine and riverine waters are suggested. The following is a "cut and paste"

brief literature review from the January 27, 2022 filing. Literature citations can be found in the January 27, 2022 filing.

A 1981 summary by Maine research biologists Fred Kircheis (MeDIFW) and Jon Stanley (UMO Coop Fish Unit) reviewed smelt populations in Maine and other Lakes throughout the Northeast. Regarding variability in smelt population abundance/densities, they concluded that *"such fluctuation are usual and do not appear related to predator abundance, rainbow smelt fishing or disease." Rainbow smelt larvae require small zooplankton such as rotifers when they begin feeding, "unavailability of suitable size plankton might limit survival of larvae" (McCullough and Stanley, 1979)."* (Kircheis and Stanley 1981). The literature provides insight into a litany of factors determining smelt abundance and growth.

Based on extensive review of the literature, the primary reason for a reduction in larval/juvenile smelt year class is cannibalism by age II and older smelt. Smelt are known to demonstrate alternate year class strength, often resulting from cannibalism as well as variable population densities resulting from predation or loss of suitable zooplankton as forage. Stet er et al. (2007) reported cannibalism at between 38 and 95 percent of YOY year class strength. This cannibalism typically produces alternate smelt years classes where larval survival is poor the first year but strong the next year(s) (Lantry, B.F., and Stewart, D.J. 2000). He and Labar (1994) studying Lake Champlin smelt populations noted that gaps in year class strength could extend for three to five years.

Ripogenus Impoundment juvenile smelt are the critical forage item for the impoundment and West Branch salmon. During 1980 – 1989 then Great Northern Paper (GNP) sampled smelt weekly. The catch was largely larval/juvenile smelt ranging between 35 and 100 mm over time. Smelt of this size are known to be the preferred prey of salmon. GNP's 1991 Application contained references to an average annual smelt catch of 25,000 pounds. Post 1996 licensing smelt information is limited to 1999-2001 GNP collections and time available 2021 -2022 MeDIFW sampling. The ISR did not directly address the FWS request. However, Smelt collected in the 2022 electrofishing survey of the Ripogenus

Impoundment were older and generally too large to be suitable salmonid prey.

The Maine Department of Inland Fisheries and Wildlife (MeDIFW) stated their concerns with the apparent lack of juvenile smelt in their June 8, 2021 filing.

*June 8, 2021 The inland fisheries management goals for the Ripogenus impoundment and river have not changed since the last license was approved; however, there has been a significant change in the quality of the landlocked salmon fishery in both locations. The decline in salmon growth is related primarily to a surplus of salmon in the impoundment and resulting lack of smelt, the primary forage* fish.

From the literature the primary reason for smelt year-class failure is cannibalism by older smelt. However, other reasons are given: reduced abundance of zooplankton, namely rotifers; reduced, fluctuating, or lost littoral zones; and depressed metalimnion areas are referenced along with turbidity. Over predation by salmonids can exist with Lake trout and salmon interaction but is rarely mentioned with a single salmonid species over an extended time period (five plus years), landlocked salmon in this case. MeDIFW has been attempting to rejuvenate the Ripogenus salmon population for five plus years, well past the length of any recorded year classes failure. While over predation of juvenile smelt by adult (>12") salmon may well be part of the problem, it cannot be the only cause. A likely second important factor is lake level management issues. These factors need to be investigated.

Currently there are no quantifiable Ripogenus smelt data in the post 1996 record (Incomplete 1999-2001 GNP data were recently added). The Licensee's search of MeDIFW files produced 2021 and 2022 West Branch smelt "drift net" catches. MeDIFW has limited resources and cannot be expected to travel to the West Branch on a regular basis. MeDIFW data, were based on "time available" and lacked river flow,

volume of water sampled and time "fished". No smelt length or weigh measurements were provided. Simply put, these data are not comparable to 1980-1989 and 1999-2001 GNP collection. Other than smelt were present in the West Branch in brief periods of 2021-2022, there are no quantifiable comparisons between GNP data and recent MeDIFW collection. The status of the Ripogenus Impoundment and Downstream West Branch smelt population is unknown and critical in Water Quality Certification and fisheries management.

A study is needed of the Ripogenus smelt population(s) focusing on spawning, egg survival, fry escapement, zooplankton availability with the emphasis on rotifers, and survival of smelt though their first year. Smelt contribution, if any, to "drift" in the West Branch downstream of McKay Station needs to be determined.

1.Describe the goals and objectives of each study proposal and the information to be obtained.

The goals of this study are to determine the status of the Ripogenus smelt population by following an age class from egg to Age I and determine any contribution of this cohort to the West Branch downstream of McKay Station and its salmonid fishery.

2. If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.

Rainbow smelt are the primary food source of Ripogenus Impoundment and Downstream West Branch salmonid fisheries. MeDIFW has noted the paucity of smelt in these waters. These apparent (but undocumented) shortages have resulted in failures to meet fisheries management goals.

3. If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;

I am a private individual who worked for then GNP and was responsible for (West Branch) fisheries study deigns, data collection and analysis and coauthoring the current Ripogenus and North Twin Projects FERC License application. I remain interested in the WB fish and aquatic communities and fish there often. Returning the Ripogenus Impoundment and downstream West Branch fisheries to their 1996 status is surely in the public interest. Additionally, this request parallels an US Fish and Wildlife request found in Fish Assemblage Study Report Appendix II*, USFWS Comments on Draft Fish Assemblage Study Plan, August 4,2022. The USFWS request was not implemented because* "FERC did not require smelt spawning or drift surveys in the SPD" (Appendix P 114).

4. Describe existing information concerning the subject of the study proposal, and the need for additional information.

There is NO existing fisheries information, thus this is NOT an additional information request. Studies provided by the Licensee are old PRE-Peaking and thus, irrelevant. The impoundment and water level management are no longer managed for the steady needs of paper making. Flows and lake levels are now managed for widely variable market driven power needs. There is no current (quantifiable) information on the Ripogenus smelt population(s). The current spawning success, age class structure, food availability is unknown as is "smelt drift" below McKay Station. Critical data gaps exist and information gathered will help FERC staff balance the competing use of the resource.

5. Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.

The Licensee has changed project operations from a relatively stable base flow used in papermaking to a peaking operation with a concurrent change in lake level management to more common and drastic drawdowns. This change in operations has had a direct impact on smelt life history as well as on angler use and salmon growth, abundance, and possibly spawning success. The continuing energy market driven peaking operations and corresponding earlier and more drastic drawdown will reduce, at a minimum, juvenile smelt availability to lacustrine and riverine salmonid populations, namely salmon.

6. Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.

This is a multigoal study: description of the Ripogenus juvenile smelt population and subsequent export into the West Branch below McKay Station.

A Ripogenus Impoundment tributary such as Ragged Stream should be confirmed as providing suitable smelt spawning escapement. Subsequent spawning success would be measured following methods described in a recent MeDIFW Report, **Developing Catch Indices for Rainbow Smelt Fry Outmigration on North Brook, Lily Bay Moosehead Lake,** By:Stephen Seeback, Moosehead Lake Region, including age information on spawning adults.

**The distribution and timing and outmigration of larval juvenile smelt would be followed by bi-weekly (vertical) plankton tows as**

**well as horizonal larval smelt sampling with approximate methods e.g., oblique plankton trawls beginning in the shoreline littoral area continuing out into pelagic** epilimnion/**metalimnion zones (as the impoundment stratifies). Lacustrine sampling should continue into October.**

**Riverine sampling. Smelt "drift" into the West Branch, is the other "end" product of this study request. It is the Ripogenus Impoundment juvenile smelt population that supported the historic West Branch salmon population. The presence of a relatively constant (juvenile) smelt drift is the reason this fishery existed. Today, smelt drift has declined as has the salmon fishery. GNP 1991 described weekly sampling protocols and these methods should be followed**

7. Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information.

The burden of determining the status of the Ripogenus smelt population rests with the Licensee and NOT MeDIFW. The cost will be moderate when compared to the Fish Assemblage study and the result(s) will fill several data gaps. Without a description of lacertine smelt abundance and downstream smelt drift information, FERC staff will lack quantitative information on which to balance the competing users of the resource. There is simply no other method of evaluating smelt populations other than field sampling over an extended time period.

Ideally MeDIFW would be fully funded, including money for additional staff, to carry out smelt component of the study.

Collection and identification of zooplankton would be the Licensee's responsibility as would basic water quality information (temperature and dissolved oxygen).

Thank you for the opportunity to comment and for your consideration of the proposed study.

Ed Spear
307 Mt Hope Ave.
Bangor, Me 04401
Email: edspear1@yahoo.com
Phone: 207-217-4288

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FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426
July 6, 2023

OFFICE OF ENERGY PROJECTS

Project Nos. 2572-133 & 2458-247 –
Maine
Ripogenus Hydroelectric Project
Penobscot Mills Hydroelectric Project
Great Lakes Hydro America, LLC

VIA FERC Service

Randall Dorman, Licensing Manager
Brookfield Renewable
150 Main Street
Lewiston, Maine 04240

**Reference: Staff Comments on the Initial Study Report and Initial Study Report Meeting Summary**

Dear Mr. Dorman:

We have reviewed Great Lakes Hydro America, LLC's (GLHA) Initial Study Report (ISR) and associated draft study reports for the Ripogenus Hydroelectric Project (Ripogenus Project) and the Penobscot Mills Hydroelectric Project (Penobscot Mills Project), filed on April 24, 2023. We also attended the ISR Meeting held May 2-4, 2023, and the Environmental Site Review held May 5, 2023, and have reviewed the ISR Meeting Summary filed on May 22, 2023.

We provide our comments on GLHA's ISR and associated filings (i.e., study reports and ISR Meeting summary) in Attachment A. Unless otherwise noted, please address the comments in Attachment A in the Updated Study Report, which must be filed by April 22, 2024.

If you have any questions, please contact Allan Creamer at (202) 502-8365, or via email at allan.creamer@ferc.gov.

Sincerely,

STEPHEN BOWLER Digitally signed by STEPHEN BOWLER Date: 2023.07.06 08:45:58 -04'00'

Stephen Bowler, Chief
South Branch
Division of Hydropower Licensing

Attachment: Attachment A

# ATTACHMENT A

## STAFF COMMENTS ON THE INITIAL STUDY REPORT AND INITIAL STUDY REPORT MEETING SUMMARY

### *General*

1. During the Initial Study Report (ISR) meeting, and as documented in the ISR Meeting Summary filed May 22, 2023, several stakeholders expressed concern over the lack of consultation in developing and implementing the study plans. For example, as we noted, the Environmental Justice Study was to be conducted in consultation with the Penobscot Indian Nation and other relicensing stakeholders, which did not occur. The Maine Department of Marine Resources (Maine DMR) expressed concern with the lack of consultation regarding the methodology used for the Upstream American Eel Passage Study. Finally, while the Maine Council of Trout Unlimited (Maine TU) filed comments on the proposed Fish Stranding Study Plan,[1] the final study plan was not communicated to Maine TU or other key stakeholders prior to the study's implementation.

   The Study Plan Determination (SPD) issued May 13, 2022, specifically required that the Environmental Justice Study be conducted "in consultation with the Penobscot Indian Nation and other relicensing stakeholders." As we note above, this consultation did not occur during the first year of studies. To ensure that the Environmental Justice Study is completed in accordance with the approved study plan, conduct consultation with the Penobscot Indian Nation and other interested relicensing stakeholders during the second year of studies.

   With regard to general consultation with stakeholders in the Integrated Licensing Process (ILP), section 5.1(e) of the Commission's regulations states that the purpose of the ILP process is to "provide an efficient and timely licensing process…" To ensure an efficient process, the ILP is designed to increase public participation in the pre-filing consultation process, including the development and implementation of requisite study plans.[2] The ILP can be most effective when, where appropriate, the final details of study design (e.g., methodologies) are worked out in consultation with the stakeholders, and that final study plans are provided to the stakeholders, prior to the study plan's implementation. To meet

[1] *See* for example, https://elibrary.ferc.gov/eLibrary/filedownload?fileid=90D0F7B7-4841-C14B-9EC9-836B8D600000.

[2] *See* sections 5.12 and 5.13(b) of the Commission's regulations.

this intent, please manage the second study season with a more proactive and inclusive approach to stakeholder consultation.

***Historic Operations Data Assessment Study***

2. The results of the Historic Operations Study were presented during the ISR meeting. The presentation included graphical representations of lake levels and flows through the Ripogenus and Penobscot Mills Projects' developments. GLHA filed the operations data in electronic format on May 22, 2023, along with the ISR Meeting Summary. To assist us and other stakeholders in comparing actual operational releases to the licensed releases, as well as better understanding the details of how the projects are operated, please revise the excel spreadsheets for each of the projects' developments to correlate the historical hourly flow data with the licensed flow requirements at the time.

***Operations Model Study***

3. During the ISR meeting, and as documented in the ISR Meeting Summary, Maine TU raised concerns regarding the results of the validation run of the Operations Model. Maine TU indicates that, for the calendar year 2020, the modeled results do not line up well with the actual reported impoundment levels and releases for the Ripogenus Project.[3] To address concerns about the CHEOPS (Computer Hydro Electric Operations and Planning Software) model and to improve the outcome of the second year of the study, which involves developing alternative operating scenarios to model, GLHA raised and the group discussed the concept of GLHA establishing a working group for the operations modeling. Establishing a working group could be beneficial to this process. If such a group is established, a technical work session could be convened to familiarize the members of the working group with the CHEOPS model, including how it works, as well as the models' assumptions and limitations. Such an approach could help to improve understanding of the model and ensure that all reasonable alternatives identified by stakeholders are modeled during the second year of studies.

[3] Figure 1-101 in Attachment 1 of the Operations Model Study Report shows that the model simulated less outflow from the Ripogenus Project than the reported outflow. This results in simulated elevations that are higher than reported elevations in the Ripogenus impoundment.

***Fish Stranding Study***

4. GLHA's Fish Stranding Study Report included in the ISR and the fish stranding report filed by Maine TU on October 19, 2022,[4] show that dropping flow at McKay Station from generation releases to 510[5] cubic feet per second (cfs), when the generating units trip offline, results in fish and macroinvertebrate[6] stranding, and mortality. As indicated in the ISR Meeting Summary, we noted at the ISR meeting that, while the methodologies and geographic scope of the two studies varied, the results of both studies show that stranding and mortality of aquatic organisms is occurring during the unplanned outages at McKay Station. We suggested that the next step is to determine the frequency and significance of the fish stranding and mortality, and if the events warrant mitigation. To this end, we discussed the possibility of GLHA reviewing the results of the two studies in consultation with the U.S. Fish and Wildlife Service, Maine Department of Inland Fish and Wildlife (Maine DIFW), Maine TU, and other interested stakeholders to determine: (a) what effect, if any, the unplanned outages at McKay Station have on the fish and macroinvertebrate populations in the West Branch of the Penobscot River; and (b) if appropriate, identify potential ways to address fish and macroinvertebrate stranding and mortality downstream from McKay Station.[7]

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[4] *See* https://elibrary.ferc.gov/eLibrary/filedownload?fileid=086DE661-0456-C845-A09B-83F0C9000000.

[5] The existing license requires, and the approved study plan stipulates, that the minimum flow of 400 cfs be passed in the case of a station trip (i.e., generating units tripping off-line). However, due to the installation of a new breaker system for the generating units at McKay Station, the low flow now passed during a station trip is 510 cfs.

[6] Macroinvertebrates are animals lacking a backbone that are large enough to see without the aid of a microscope. They may be aquatic or terrestrial; the aquatic organisms often being larval or nymph forms of terrestrial species. Aquatic macroinvertebrates include annelids (segmented worms), mollusks (e.g., freshwater mussels), arthropods/ crustaceans (e.g., crayfish), arachnids (spiders), dragonflies and damselflies, stoneflies, mayflies, caddisflies, true bugs, beetles, true flies, and others.

[7] Examples of such measures could include: (a) identifying a minimum flow that reduces the amount of stranding that is occurring; (b) a battery back-up system that supplies power to a unit or units at McKay Station when the main power source is unavailable, which would reduce the amount of time at the low flow; (c) automating a gate at Ripogenus Dam so that when McKay Station trips offline a gate opens to release a preset minimum flow to the West Branch of the Penobscot River downstream from Ripogenus Dam; etc.

***Instream Flow and Habitat Assessment Study (Stone Dam)***

5. The Instream Flow and Habitat Assessment Study for the West Branch of the Penobscot River downstream from Stone Dam shows that a flow of 300 to 400 cfs would increase wetted area and substantially improve the availability and suitability of habitat for brook trout (juveniles and adults), land-locked salmon juveniles, and macroinvertebrates in the reach.[8] The model estimated that habitat suitability for juvenile and adult brook trout, as well as juvenile land-locked salmon would increase with flows up to 500 cfs (juvenile trout and salmon) and 700 cfs (adult trout), before declining. Habitat suitability for land-locked salmon adults would increase with flow up to the maximum flow of 2,000 cfs, and habitat for macroinvertebrates would increase with flows up to 1,000 cfs before declining. Also, Maine DIFW expressed interest in establishing a put-and-take brook trout fishery, as well as improving habitat conditions for land-locked salmon, in this reach. Given these results indicating the fishery potential in the reach, we asked during the ISR meeting, as documented in the ISR Meeting Summary, about the fishability (i.e., the potential for anglers to safely wade and fish) of the reach at the range of flows modeled (0 to 2,000 cfs). Please address the suitability of the reach for angling under the range of flows studied, and identify the flow (or flow range) where the reach is no longer suitable for wading, in the final Instream Flow and Habitat Assessment Study (Stone Dam) Report.

***Common Loon Management Plan Assessment Study***

6. During the ISR meeting, as documented in the ISR Meeting Summary, Maine DIFW asked whether the operations model can be used to evaluate whether or not Ripogenus impoundment levels could be maintained to support loon nesting activities. We stated that we thought that the model could be used for this analysis, but suggested it could be difficult to achieve, based on water use balance considerations. To clarify our statement, the model could be used to evaluate whether Ripogenus impoundment levels can be maintained to support loon nesting. However, balancing competing uses of the system's water to achieve stable water levels during the loon nesting period in Ripogenus impoundment

[8] The actual suitability of habitat gained with increased flow, however, would be limited by water temperatures in the reach during the summer months. Water temperatures in 2022 averaged about 23 °C (73 °F), with a range from around 18 to 28 °C (64 to 82 °F). These temperatures would be more conducive to the year-round survival of land-locked Atlantic salmon than to brook trout, which require water temperatures well below the observed water temperatures to survive. *See* GLHA's Downstream Water Temperature and Dissolved Oxygen Study Report.

could be challenging. Nonetheless, please work with Maine DIFW to identify and model alternative operating scenarios that could improve loon nesting success on the Ripogenus impoundment.

***Recreation Study***

7. The approved study plan required that provisions be added to the Recreation Study for: (a) semi-structured interviews; or (b) focus groups comprised of interested, individual recreation users (e.g., whitewater boaters and anglers), commercial outfitters, and camp owner/operators. The generally accepted practice in the scientific community for qualitative interviews for recreation needs assessment involves the preparation of an interview script, which is then read by an interviewer at a specific location to garner input from recreationists in a semi-structured, relatively consistent manner. While the ISR contains useful recreation use data, the recreation study plan, as required, was not followed, nor did the study follow generally accepted scientific practice. Because these data were inconsistently collected during the 2022/23 study season, adding this component to the second (2023/24) year of studies would provide a mechanism to obtain consistently collected information at some of the informal and formal recreation sites at the projects. Additionally, due to the low number of survey responses for the Penobscot Mills Project and to subsequently increase the number of surveys, please consider: (a) reinstalling QR code survey kiosks with instructions that are clearer than those used in the first year; (b) include a textual link to the online survey at each kiosk; and (3) include a link to the survey on Brookfield's relicensing website.

***Aesthetic Study***

8. GLHA collected baseline information from key observation points (KOPs) at the Projects as part of its aesthetics study. However, the KOP evaluation team did not include representatives from stakeholder groups, as required in the approved study plan. Adding non-GLHA representatives to the study design will provide a means to learn what KOPs are important to a larger audience. Therefore, expand the evaluation team for this study to include interested representatives of Maine Bureau of Parks and Lands, American Whitewater, Appalachian Mountain Club, Camp Owners Associations, and other interested stakeholders.

Filed via "eFiling"

July 6, 2023

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Division
888 First Street, N.E.
Washington, D.C. 20426

**RE: Comment on Initial Study Report, Ripogenus Project (FERC No. 2572) and Penobscot Mills Project (FERC No. 2458)**

Dear Secretary Bose,

These comments are in response to the Initial Study Report, submitted to FERC on April 24, 2023 by Great Lake Hydro America, LLC (GLHA). The Bureau has been an active participant in the combined Integrated Relicensing Process (ILP) for these Projects, providing input to the development of the study plans for the Recreation and Aesthetics Studies. We also attended the in-person ISR meeting in Millinocket on May 4, 2023, when the Recreation and Aesthetics Studies were discussed. Based on that participation and on the Year 1 study results, we offer the following comments on study deficiencies, recommendations to address those deficiencies (including modified implementation of the study plans) and requests for new information gathering.

## Comments on Study Deficiencies and Recommendations to Address Those Deficiencies, Requests for Modifications of Approved Studies

Recreation Study

*Recreation User Survey:* The number of completed recreation surveys is very small for both Projects, and in particular for the Penobscot Mills Project (34 total), where no more than 10 recreation users were surveyed at any site. The Bureau considers the low number of survey participants substandard, particularly given the amount of use of the sites, as documented by the Recreation Use Assessment portion of the study, and an indication that the passive methodologies used (with no in-person contact with recreationists in the field) was not adequate. As a result, this portion of the recreation study is deficient.

Although survey kiosks with QR codes and the on-line survey were available through February 2023, the ISR reports only on data collected through January 10, 2023; reporting on remaining survey data has been postponed to the Updated Study Report. However, as documented in the correspondence for the Recreation Study (Attachment 11 of the study report), the contractor conducting the recreation study was concerned about atypical winter conditions, hampering opportunities for snowmobiling and ice-fishing, in early 2023. The atypical conditions persisted, resulting in a significantly delayed season and likely reduced recreation activity. Given these facts, the recreation survey for the winter season should be supplemented with additional data collection.

The ILP schedule does not permit a full second-year visitor survey to be conducted, since the summer recreation season will have passed before FERC issues a Study Plan Determination. Nevertheless, we believe it is worthwhile to conduct additional recreational surveys during the fall and winter of 2023-24, after FERC issues the Study Plan Determination. ***We therefore request that GLHA conduct a Year 2 fall and winter survey as the ILP schedule permits, and supplement (or replace) the use of kiosks and online surveys with the addition of in-person surveys, to obtain more representative data. (Note: the potential addition of in-person surveys is the only modification of approved Study Plans we are requesting.)***

*Recreation Site Boat Launch Usability Assessment – Ripogenus Impoundment*: The text in the relevant portion of the ISR (pp. P-158 - P-161) is confusing and doesn't fully align with the associated graphs (Fig. 5.25 and Fig. 5.26). The elevations cited in the text for Caribou Lake Put-in and Chesuncook Dam Point Boat Launch correctly indicate that the full pool elevation is ~ 941.6 ft. However, the text refers to the "high water mark" when presenting the field analysis of the length of the ramps that is usable and uses that as the basis for the minimum usable elevation calculations and the slope lines presented in the figures. (The "high water mark" elevations are not provided in the text, only in the formulas embedded in the graph .) It is not clear why the "high water mark" elevations were used, nor why that elevation would differ between the two sites that are on the same impoundment. Also, the method used to determine the elevation at the furthest usable extent of the launches (80 ft. at Caribou and 150 ft. at Chesuncook Dam Point) is not explained. The differences between the "high water mark" elevations presented and the full pool elevation (-2.6 ft at Caribou and -1.6 feet at Chesuncook Dam Point) make it more difficult to interpret the results. ***Therefore, we request that the minimum usable elevation calculations and graphs be revised in subsequent reports using the Ripogenus impoundment full pool elevation.***

One of the primary metrics the Recreation Study uses to measure and present launch usability is a 2010-2022 Memorial Day to Labor Day duration analysis, indicating the percent of time during that 13-year period each launch was usable based on the minimum usable elevation and impoundment elevation data. While this multi-year data is relevant, given the year-to-year variability in impoundment elevation, and the fact that multiple dry/low-water years may occur is succession, we believe an analysis that focuses on launch usability in individual years is more meaningful. An indication of this can be deduced from the text on page P-161, that indicates the Chesuncook Dam Point boat launch was unusable at least part of the Memorial Day to Labor Day season five of the seven years between 2015 and 2021. As an example, hourly impoundment elevation data (provided to ILP participants separately by GLHA) indicates the

Chesuncook Dam Point launch was unusable 82 out of 99 days between Memorial Day and Labor Day 2021. It would be useful to know the first day after Memorial Day and the total number of days each launch was unusable during each year the impoundment elevation fell below the minimum usable elevation, and the average number of such days over those seasons. ***Therefore, we request these additional analyses focused on individual years be conducted and included for both Ripogenus impoundment launches in subsequent reports.***

Regarding the graph figures, we request the following modifications, which we believe would improve stakeholder's understanding of the final study report: 1) clearly mark with a horizontal line the minimum elevation at which each facility is usable, *with 3 feet of water depth* (the "Elevation Boat Launch is Unusable" label on Fig. 5.25 is mislocated in this regard, and disagrees with the text), and 2) add a legend for the lines on each graph (it is not clear from the labeling what the solid lines are intended to represent, perhaps actual (vs. calculated) launch elevation/slope?).

*Boat Launch Usability Assessment - Fall Season*: In our comments on the Proposed Study Plan (2/22/22), we stated our interest in verifying boat access on the Project water bodies through the ice-free season (generally May through November). In particular, it is critical to include the fall season in evaluating access to the Ripogenus impoundment, given the importance of the fall angling season (closing Sept. 30) for landlocked salmon on Chesuncook Lake and the West Branch upstream of the lake. As documented in the PAD, this is a "high-quality and important fishery in Maine, and a primary source of recreation in the area." There are also fall fishing opportunities for landlocked salmon and other coldwater species on the North Twin and Millinocket Lake impoundments, which are open to fishing all year. However, the boat launch usability assessment component of the Recreation Study references a Memorial Day to Labor Day recreation season (p. P-161) and bases the calculations of the percent of time the launches were usable on that period. ***Therefore, in order to fully meet the study objective to "…assess the accessibility and useability of select Project boat launching facilities provided at the FERC-approved Project recreation sites…" the Bureau requests that the period of analysis for the boat launch usability assessment be extended through the fall season (November) in subsequent reports.***

*Interviews or Focus Groups*: In response to requests from BPL and others, FERC in the Study Plan Determination (5/13/22) recommended use of "…interviews or focus groups with interested individuals representing recreation user groups (e.g., whitewater boaters, anglers), commercial outfitters, and campground owner/operators" (p. B-41). No interviews or focus groups have been conducted or scheduled; therefore, the study was not conducted as provided for in the approved Study Plan. These qualitative methods can provide valuable additional information and fill gaps in information collected through the Recreation User Surveys. They have additional importance in this case, given the low number of Recreation User Surveys completed, as noted above. ***Therefore, the Bureau requests that interviews or focus groups be conducted as part of the Year 2 data collection for the Recreation Study.***

**Requests for New Information Gathering**

The Bureau is not requesting entirely new studies. Rather, we believe certain additional information gathering within the context of or as an extension of the approved Year 1 studies is

appropriate, as detailed below. We are requesting a new, focused, Whitewater Boating Study, as a next step in investigations on the West Branch below Stone Dam; however, the potential for this study was mentioned by FERC in the Study Plan Determination, and we therefore consider it an extension of the existing Study Plan rather than an entirely new study.

Recreation Study

*West Branch Below Stone Dam - Recreation Access Assessment*: In the Bureau's comments on the Proposed Study Plan (2/22/22) we requested that the Recreation Study include evaluation of recreation access to the West Branch below Stone Dam and of a potential portage around Great Falls. Although this was not required in the Study Plan Determination, we believe the results of the Whitewater Boating Assessment Study and the Instream Flow and Habitat Assessment of West Branch Downstream of Stone Dam Study provide significant new information that justifies this requested evaluation.

This river reach was included in the Whitewater Boating Assessment Study, but that "Level 1" study was limited to existing information and paddler knowledge. As such, the report describes only the current very limited access and boatable flows (based only on spill and seepage), and bases boating opportunity and experience information on interviews with only two individuals. That study report states "this reach offers little value regionally" due to limited access, flow availability and unfavorable rating of the experience provided (due to the preceding factors). However, the paddler interviews conducted for the Whitewater Boating Assessment Study highlight the Class II to IV whitewater available with sufficient flows, easily accessed in contrast to the more remote West Branch reach below McKay Station. Moreover, the whitewater paddling community remains strongly interested in the potential for enhanced opportunities on this reach of river, which could result from the ILP if limited access and flow availability are addressed in the new license.

Also, although analysis of alternative minimum flows has not yet been conducted, the minimum flows under consideration (as reported in Appendix F – Instream Flow and Habitat Assessment of West Branch Downstream of Stone Dam Study) and, more specifically, that appear to maximize most habitat goals generally coincide with the 700-1000 cfs minimum boatable flows thus far indicated by the Whitewater Boating Study. Lastly, access for anglers who would take advantages of MDIFW's proposed put-and-take landlocked salmon and brook trout fishery have not been addressed.

This river reach flows through the Backchannel Wildlife Management Area, which is managed by GLHA and open to the public. Based on existing gravel roads to and through the WMA and associated connections to paved public roads (e.g., State Route 11), public road access to the reach would likely cross the WMA. However, information is lacking on the extent and condition of the current gravel road system that could provide access to the river, and to likely put-in and take-out sites, which are also within the WMA.

***Therefore, we request that the Recreation Study in Year 2 include additional information gathering to assess potential improved access to the reach for both anglers and paddlers and a potential portage around Great Falls. The Bureau specifically requests, given that the***

***minimum flows required in the new license may result in boatable flows on this reach and an enhanced fishery, that the Recreation Study be modified to include:***

- ***assessment of public road access to the channel,***
- ***assessment of potential put-in locations near Stone Dam and take-out locations on the channel upstream of Shad Pond for paddle-craft, and***
- ***assessment of a portage route around Great Falls.***

Whitewater Boating Assessment Study

*Potential Means to Provide Boatable Flows in West Branch below Stone Dam*: The Whitewater Boating Assessment Study report states that "there are no gates that could be used to provide controlled flow releases into this reach" (p. Q-12), while later stating that "releases are typically made by deflating the inflatable dam" (p. Q-50). GLHA, in response to comments on the Proposed Study Plan, as recorded in the Revised Study Plan, stated that the pneumatic flashboard system at Stone Dam is not capable of consistently providing the precise or sustained flows necessary for conducting a controlled flow study; FERC confirmed this in the SPD. However, it is not clear to us whether that system could provide suitable recreation flows, where precision is not required. Although potential increased minimum flow in the reach is being investigated, the Whitewater Boating Assessment Study assumes boatable flows would be available only during spill events. ***In order to more fully meet the goal of the Whitewater Boating Assessment Study to "…use existing hydrologic and Project operational data to assess the frequency and timing of acceptable paddling flows under current and proposed Project operations…" we request that the licensee provide additional information to clarify the potential for increasing minimum flow and for controlled flow releases for recreation, with the current dam structures or with some type of modification to those structures (e.g., new gates).***

*West Branch Below Stone Dam – Level 2 or Level 3 study*: FERC, in the Study Plan Determination discussion of the Whitewater Boating Assessment Study indicated that "a Level 2 or Level 3 study may be deemed necessary as a result of the Level 1 study findings". The approved Level 1 study did not provide sufficient information to meet the Study goal to assess "acceptable paddling flows under current and proposed Project operations" on this river reach, with only two interviews conducted, and otherwise relying on existing video documentation, with little correlation between the minimum boatable flow data derived from each source. We therefore believe a justification has been demonstrated of the need to conduct a Level 2 or 3 study on this reach. The flows to be evaluated should consider both the Level 1 Whitewater Study information and the results of the Instream Flow and Habitat Assessment of West Branch Downstream of Stone Dam Study. The additional information to be provided through a Level 2 or Level 3 Whitewater Study would help inform pending analysis of alternative minimum flows for this reach. ***We therefore request a Level 2 or Level 3 Whitewater study be planned with the cooperation of American Whitewater and other paddling interests, with flows provided in an appropriate range for land-based or water-based evaluation by paddlers, to further investigate potential recreation flows.***

Aesthetics Study

*Upper Gorge:* The Aesthetics Study Plan acknowledges the scenic value of the gorge, as viewed from the Upper Gorge Trail. Indeed, the gorge is among the most dramatic in the state, and the Upper Gorge Trail provides the best opportunity for the public to view it (particularly for non-

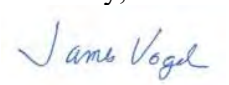
boaters and non-anglers who do not venture into the gorge itself). However, the Aesthetics Study KOP ratings for this site (which combined Ripogenus Dam and the Upper Gorge Trail) focused on views of the dam and of the lake. (Notably, the Recreation Study did not seem to adequately capture use of the gorge trail, and user's experiences on the trail, with only nine users surveyed and at the ISR meeting it was stated that most of those observed at the site did not leave the dam or dam parking area.) As such, the goal of the Aesthetic Study to "…develop baseline documentation of the scenic views…from KOPs where the Project area is frequently viewed by the public..." has not been fully accomplished.

Furthermore, an important variable affecting the aesthetic value of the gorge is the level of river flows. But the aesthetic benefit of various flows in the gorge was not effectively addressed in either the Recreation Study or the Aesthetics Study. We, therefore, believe that the approved Aesthetic Study methodology does not fully meet the goals and objectives of the approved study for this site.

While we do not now propose that an Aesthetic Flow Study be conducted, as at other dams currently undergoing relicensing in Maine, we believe existing and potential recreational flows and habitat flows in the gorge under the future new license have aesthetic value and these should be evaluated. ***We therefore request that the licensee undertake new information gathering, with an aesthetic evaluation of the views of the gorge from the dam and the gorge trail under various spill or scheduled whitewater flows. This could be accomplished using the existing KOP evaluation form.***

Thank you for the opportunity to submit these comments. Please feel free to contact me at (207) 287-2163 or via email at Jim.Vogel@maine.gov if you have any questions.

Sincerely,



Jim Vogel, FERC Coordinator
Bureau of Parks and Lands

Cc: Andrew Cutko, Director
John Perry — MDIFW
Kyle Olcott, Laura Paye — MDEP

STATE OF MAINE
DEPARTMENT OF MARINE RESOURCES
21 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0021

JANET T. MILLS
GOVERNOR

PATRICK C. KELIHER
COMMISSIONER

July 6, 2023

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington DC 20426

**Subject: Maine DMR comments on Ripogenus Hydroelectric Project (FERC No. 2572-133) and Penobscot Mills Hydroelectric Project (FERC No. 2458-247) Upstream and Downstream American Eel Initial Study Report**

Dear Secretary Bose:

On April 24, 2023, Great Lakes Hydro America, LLC (Licensee) submitted their Initial Study Report for the Ripogenus Hydroelectric Project (FERC No. 2572-133) and the Penobscot Mills Hydroelectric Project (FERC No. 2458-247) on the West Branch of the Penobscot River in Maine. Enclosed are the Maine Department of Marine Resources (MDMR) comments focusing on the Upstream and Downstream American Eel portion of the study report.

Furthermore, on June 28th, the Maine Council of Trout Unlimited sent their draft comments on the Initial Study Report to MDMR, which include a request for a ramping study. MDMR supports this request for a ramping study. Analysis of the Licensee's hourly flow data by the National Marine Fisheries Service, included in TU's comments, clearly demonstrates that operations have changed since the previous relicensing and that peaking is occurring. Peaking operations can negatively impact both resident and migratory fish species through stranding and direct mortality, and through declines in the macroinvertebrate community. Thus, MDMR urges the Commission to approve the Maine Council of Trout Unlimited request for a ramping study.

MDMR looks forward to further collaboration with the Licensee on diadromous fish passage at the Ripogenus and Penobscot Mills projects. Please contact Casey Clark (casey.clark@maine.gov; 207-350-9791) or Lars Hammer (lars.hammer@maine.gov; 207-557-1564) if you have any questions.

Sincerely,

Sean Ledwin

Sean Ledwin
Director
Bureau of Sea-Run Fisheries and Habitat

OFFICES AT 32 BLOSSOM LANE, MARQUARDT BUILDING, AUGUSTA, MAINE
http://www.Maine.gov/dmr
PHONE: (207) 624-6550 FAX: (207) 624-6024

**MDMR Comments on US American Eel Passage Study Report**

Page 4: Methodology "Survey techniques included repeated visual, nighttime observations from safely accessible locations along Project structures at the dam; these techniques are frequently used to identify whether eels are arriving at a dam and where they attempt to pass upstream. Survey areas at the East Millinocket Development included the dam face, spill gates, wooden flashboard section of the spillway, and concrete piers, which were accessed from a walkway across the top of the dam (Figure 1). Surveys were also completed along the river right abutment of the dam (Figure 1). Researchers used binoculars and spotlights with infrared lighting to observe eels during non-spill conditions.

General requests from MDMR for inclusion in the study methods:

- Please include a specific description of the lighting used during the surveys.
- Please include a depiction of how far across the spillway the walkway extends. Please also include a depiction of how far into the river the river right access in Figure 1 extends.
- Please include a description of how far from the project features observers were during the surveys. Please also include a description of how far observers were from the downstream edge of the skirt of spillway.
- Were observers able to see the area between the powerhouse and the spillway that is shown in photo 1? Specifically, the powerhouse side of that area?
- Did observers survey the river left side of the powerhouse?

Page 4: "Surveys were planned for the last week in May, first week in June, and last two weeks of October; however, American eels could not be observed due to the amount of water spilling over the dam during those times."

Page 5: "An initial survey was planned for the last week in May of 2022, shortly after the SPD was issued; however, that field effort was cancelled due to spill of seasonal high flows occurring at the dam, which prevented safe and effective sampling immediately downstream of the East Millinocket dam."

MDMR Comment: Note that nighttime surveys and electrofishing surveys were not completed in May due to high water. The former was also not completed in the last two weeks of October.

Page 6: "The traps were deployed on June 28 for 48 to 96 hours per week until July 28."

MDMR Comment: The short period of deployment of these traps each week and short duration through the season likely limited their effectiveness severely.

Page 7: "Each trap consisted of a covered eel ramp with eel substrates, a collection trap, batteries, solar panels, and water pumps (Photo 1 and Photo 2). Traps were placed on the river left side of the dam near where eels had been seen congregating during nighttime surveys performed in June."

MDMR Comment:

- The study plan does not provide details on the eel traps that were used. Please describe the substrate, ramp angle and length, and other specifics of the traps. Remember the basis of a scientific study is that is must be repeatable. Please include specifications so these traps could be recreated to repeat the study.

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PHONE: (207) 624-6550 FAX: (207) 624-6024

- MDMR was not consulted about the location of the traps. Had we been consulted about the location, we would have recommended placement of an additional trap on river right and below areas of seepage below the dam. In addition, we were not consulted about the request to stop the eel trapping effort.

Page 16: "Nearly all eels were seen at the top of the dam, attempting to pass under a closed steel gate at a former log sluice adjacent to the powerhouse (Photo 5, Photo 6, and Photo 7); there was a small amount of water consistently leaking from under the gate. A few eels were also observed intermittently below the flashboards on the dam face early in the migration season."

MDMR Comment: As you note, eels were likely attracted to "a small amount of water consistently leaking from under the gate." Please describe the conditions of leakage, spill, etc. at all project facilities throughout the survey period. Please also describe how these conditions were consistent with or differed from operations. In addition, please provide a description of how leakage under the gate compared to leakage over the spillway or other project features. Finally, with normal leakage passing the spillway, what is the depth and velocity of water on the skirt of the spillway? Is the depth and velocity consistent?

**MDMR Comments on Downstream American Eel Passage Study Report**

Page 2: "Calculate approach velocities at the intake for each powerhouse at the Ripogenus and Penobscot Mills Projects over a probabilistic range of inflow values representative of the expected out-migration window of September-October for comparison to American eel swim speeds."

MDMR Comment: American eels initiate out-migration under a wide range of conditions and across multiple seasons. Thus, individuals are likely migrating outside of the September-October window as well.

Page 5: "The TBSA tool was used to evaluate survival probabilities for a theoretical stock of eels characterized by a user-defined, normally distributed range of body lengths."

MDMR Comment: Please provide information to support the use of a normal distribution rather than a different distribution.

Page 35: "A total of 543 eels were netted following turbine passage at the Haandrk Power Station, River Vecht in the Netherlands. Eels at this location passed through a Kaplan turbine with a 5.2-foot runner diameter, 4 blades, and a rotational speed of 150 rpm. Survival of eels at this location (average size = 460 mm) was estimated at 76 percent.

MDMR Comment: Does this study report a range of sizes or just the mean?

Page 61: "These field-based observations are in contrast to the desktop estimated values obtained from the TBSA model assembled for the Ripogenus Project and suggest blade strike may not occur at the elevated rates predicted for this site."

MDMR Comment: It is unclear if these field-based observations can be used to make comparisons between the desktop TBSA estimates and those for Station No. 1 of the Turners Falls project. The study

does not seem to compare discharge experienced during tagging to normal project operations and flows experienced during the entirety of the eel passage season. The researchers also used a latent survival of 48 hours not 96 hours as represented in Table 11.

Page 75: “Based on the assumptions contained herein, for a median outflow condition passage success for female-sized eels was estimated at 6.4 percent for individuals originating upstream of the Ripogenus Project, 10.1 percent for those originating between the Ripogenus and North Twin developments, 18.9 percent for those originating between the North Twin and Millinocket developments, 30.4 percent for those originating between the Millinocket and Dolby developments, and 62.1 percent for those originating between the Dolby and East Millinocket developments.”

MDMR Comment: The downstream eel passage route and survival assessment demonstrated low survival across all projects (particularly in the TBSA model, which was not used to inform cumulative passage success through all projects). Please reiterate here that the TBSA model resulted in estimates of zero or near zero percent survival from all potential outmigration sources. We look forward to working with GLHA to identify protective measures to increase cumulative survival at these projects.

OFFICES AT 32 BLOSSOM LANE, MARQUARDT BUILDING, AUGUSTA, MAINE
http://www.Maine.gov/dmr
PHONE: (207) 624-6550 FAX: (207) 624-6024

Maine Professional Rafting Outfitters

July 6, 2023

Ms. Kimberly D. Bose
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Re:** Comments on the Initial Study Plan for the Re-licensure of the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458), and Request for Further Study by Maine Professional Rafting Outfitters

Dear Secretary Bose:

The Maine Professional Rafting Outfitters ("MEPRO") hereby submits these comments on the Initial Study Plan ("ISP") for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) (each a "Project" and together, the "Projects") and further requests an amended or supplemental study to address opportunities to enhance access to key areas of the river for recreational and whitewater boating purposes.

As an initial matter, MEPRO thanks FERC for the opportunity to provide comments on the ISP and looks forward to working collaboratively with the dam owners, lakefront property owners, and other interested parties to ensure that the water bodies impacted by the Projects are maintained and made accessible for commercial and non-commercial recreation activities, the lifeblood of the economy in northern Maine.

## Background

MEPRO is an unincorporated association of whitewater rafting companies that operate in and around the Penobscot River and all other major rivers in Maine. MEPRO participated in the Projects' last FERC licensing proceeding and is a party to a 1993 settlement agreement with Great Northern Paper, Inc. dated September 2, 1993 (the "Settlement Agreement") that resolved issues raised in that licensing process related to the rafting community. In that Agreement, MEPRO and the Projects' previous owners committed to "working together in partnership to assure a healthy future for their industries and an enlightened and balanced stewardship of the river resource that supports their industries." MEPRO remains committed to that sentiment. Collaboration among interested parties is perhaps more important now than it was thirty years ago, and we all share an interest in preserving the economic, recreational, environmental, and commercial vitality of these important natural resources. MEPRO members have been and continue to be committed to a thoughtful, respectful process that maximizes use and appreciation of impacted water bodies by all stakeholders.

## Purpose of Comments and Request

MEPRO's comments and request for an amended study are intended to ensure that its members' commercial operations on the impacted river segments are maintained and enhanced to the maximum degree possible in the context of this re-licensing process. MEPRO believes that each re-licensing process presents an opportunity for various stakeholders to come together and coordinate an appropriate balance of their diverse interests with the continued operation of a hydro-electric facility.

In addition to the comments provided, which primarily relate to preserving the terms of the Settlement Agreement, this document is also a request for an amended Whitewater Study to address one of its stated objectives, evaluating the "need for additional whitewater boating opportunities in the Project region."[1] In the alternative, we request a supplemental Access Study to explore ways to increase and enhance access for commercial and non-commercial use of the West Branch of the Penobscot River and Millinocket Stream within the Project area.

## Comments

MEPRO very much appreciates that Brookfield included whitewater boating and recreational elements in its ISP and its members found those portions of the ISP to be helpful and instructive in reporting on the current conditions in those areas.

### I. Whitewater Boating Assessment Study ("Whitewater Study")

#### A. Enhancement of Use

The Whitewater Study identifies a desire to evaluate both whitewater boating conditions and opportunities.[2] MEPRO is pleased to see that whitewater rafting conditions are perceived as positive, and that users are enjoying the river. MEPRO also appreciates that the Whitewater Study identifies a large number of opportunities in the area.[3] MEPRO observes, however, that the identified opportunities do not seem to be translating to increased use, as illustrated in Figure 6.1. That disconnect is part of the basis of the request for an amended study contained herein. While the use has decreased somewhat, MEPRO members are still participating in and contributing to an important sector of Maine's economy. This sector warrants protection and enhancement wherever possible. MEPRO members bring tourists to the area, employ staff, and are an integral component of the hospitality industry in Maine.

#### B. Flow Ranges and Timing

[1] Whitewater Boating Assessment Study at Q-2.
[2] *Id*. at Q-1.
[3] *Id*. at Q-28 - Q-30.

MEPRO recognizes that minimum flows vary across different stretches of the river, and that ideal minimum and maximum flows vary based on the type of craft used to navigate the river. In the stretch beneath McKay Station, MEPRO members have found that a minimum flow of 2200 and a maximum flow of 3200 CFS is optimal for commercial whitewater rafting. Per the Settlement Agreement, minimum flows that were generally able to meet these needs have been maintained during the period running from May 1 through October 1 each year, during the hours of 8:30 A.M. to 5:00 P.M. During the established whitewater rafting season, the lower limit on releases should be 1,800 CFS at McKay station. Under extreme conditions (drought), the lower limit would be 1,600 CFS from 5:00 P.M. to 5:00 A.M. From 5:00 A.M. to 5:00 P.M. the minimum flow at McKay station would revert to 1,800 CFS. Under normal conditions, the preferred flow will be 2,400 CFS with an upper limit of 3,200 CFS.

MEPRO respectfully requests that this re-licensing process maintain those flows provided for in the Settlement Agreement.

From a timing perspective, however, MEPRO would like an opportunity to discuss the possibility that, during rafting season, the flows begin at 5:00 A.M., rather than 8:30 A.M. An earlier start would cause flows to fill up the dead waters and enable commercial trips to run the entire river. Having the opportunity to run the entire river would be a significant enhancement to the quality of the boating experience, allow MEPRO members to attract more users to the area, and should be achievable with only a minor operational adjustment. MEPRO looks forward to discussing this further, and learning more about the opportunities and impacts such an adjustment could create.

## II. Access-Related Issues

Upon review of the ISP materials, MEPRO believes that there is a gap in information relating to enhancing access to the river. MEPRO expected to see a more robust exploration of this issue in the Whitewater Study. MEPRO believes that access issues can be appropriately addressed in either in an amended Whitewater Study or in a supplemental study specific to access.

No matter what vessel is used, MEPRO members suggest that the area along the McKay Station to Debsconeag Deadwater section of the West Branch is an appropriate starting point for exploring enhanced access. Particular attention might be paid to the following specific locations:

1. Little Eddy – Access at Little Eddy (river right) to enhance an important put-in when the McKay station launch is not available due to maintenance or safety issues.
2. Big Eddy – Access immediately below Big Eddy (river right).
3. Big Amberjack - Access above Big Amberjack (river right) and below Big Amberjack (river right).
4. Nesowadnehunk Dead water - Access at the top of Nesowadnehunk Dead water (river

right).

5. Nesowadnehunk Falls - Access immediately below Nesowadnehunk Falls (river right) would allow trips to begin or end at this location.
6. Abol Bridge - Access just below Abol Bridge (river left).
7. Debsconeag Falls - Access at Debsconeag Falls. Improving access to Debsconeag Falls would add a significant section of Class V whitewater and create the potential for more robust two day trips, seven days a week all season long with no change in flows or operational models.

All the above recommended access points (ingress and egress) are important in offering a diverse variety of trips and improving the quality of existing whitewater rafting routes. Customers consistently expect more whitewater and better routes for boating experiences; improving access can help the industry better meet, and exceed, our customers' expectations. Increased opportunities for access and egress also advance safety concerns by making evacuation from the river easier.

The suggestion of either an Amended Whitewater Study or a Supplemental Access Study are expressions in the alternative – MEPRO does not suggest that both should be undertaken.

### A. Amended Whitewater Study

MEPRO suggests that amending the Whitewater Study may be the most logical place to enhance the evaluation of access opportunities, as it appears to fit squarely within one of the key objectives of that study as originally contemplated – that of evaluating the "need for additional whitewater boating opportunities in the Project region."[4] As noted in the Whitewater Study at Appendix Q-22, there has been a downward trend in commercial whitewater use of this area of the river, beginning in approximately 2005. This downward trend was exacerbated by the impact of the COVID-19 pandemic, resulting in 2020 having the lowest use rates since 2005. Even with that decline, there are between 8,000 and 10,000 rafters per season, which contribute meaningfully to Maine's economy.

MEPRO respectfully observes that the size of the industry, and the recent downward trend, provide a strong basis for exploring additional whitewater boating opportunities in order to attract more and different users. Stabilizing and stimulating the whitewater industry is of critical importance to MEPRO members and the operation of the dam provides opportunities for such enhancement, which may include increasing flows at different times of day or season.

To be clear, however, MEPRO is not currently proposing that enhanced opportunities would necessarily come from additional releases, or other activities that would stress the operation of

[4] *Id*. at Q-2.

the facility or change water levels for shoreland landowners. Instead, MEPRO would like to see Brookfield satisfy the goals of the Whitewater Study and Recreation Study Report by exploring those areas of the river that currently have sufficient flow to support rafting activities, but have challenges associated with access. MEPRO proposes that the amended study focus on whether there is a way to resolve such access issues in a manner that enhances the experience of the recreational users served by MEPRO, and by extension MEPRO's commercial operations, without negatively impacting the experience of landowners or the efficient operation of the dam for its core purpose, the generation of electricity. MEPRO believes that this might allow the Projects to enhance the industry's recovery from loss of business over time (more acutely during the Pandemic) and support the industry's efforts to become more diverse and resilient without additional impacts to other users of the resource, including landowners.

### B. Supplemental Access Study

In the alternative, MEPRO respectfully requests a supplemental Access Study to explore ways to improve and expand access to the West Branch of the Penobscot River and Millinocket Stream within the project Areas. Commercial and non-commercial recreation activities are a critical economic engine in this region. Whitewater recreation activities bring in tourism dollars from all across the country and the industry provides numerous jobs, not just for whitewater boating companies and staff, but also for ancillary services in the food and beverage, lodging, and transportation sectors. Many businesses in the region rely on the stream of rafting visitors as a primary source of income. The Projects should be required to investigate ways to preserve, but also enhance and expand, this critically important industry.

Historic markers or informational kiosks at strategic locations, like the Ripogenus Dam and the staging area at McKay Station, may provide a low-cost way to enhance the visitor experience. Markers and kiosks would also help preserve and promote the history of the Great Northern Paper Mill and the logging industry in the Project area.

Decades have passed since these Projects were last issued licenses, and FERC should take this opportunity to require Project owners to explore additional ways to increase recreational and commercial access to and use of the river resources within the Project areas. MEPRO members are interested to learn about creative solutions that could expand river access and egress to new areas, thus providing more opportunities for recreational and commercial activity in the region without negatively impacting other users or the Projects' hydropower generation activities.

A supplemental Access Study would augment other studies in the ISP, including the Recreation Study Report, whose objectives include a review of access to boat launches as part of its "facility inventory and condition assessment for the FERC-approved Project recreation sites, a recreation use assessment, a user survey, and an assessment of select impoundment boat launches."[5]

[5] Recreation Study Report at P-1.

## III. Socioeconomic Study

Finally, we take this opportunity to amplify our prior discontent with the exclusion of the Socioeconomic Study proposed by the Penobscot Indian Nation. The Licensee acknowledges that there have been significant socioeconomic changes in the region in the past 25 years, due in large part to the closure of the Great Northern Mill. The mill closure, in particular, and a decline in the availability of job opportunities in general, have had a devastating impact on the socioeconomic climate in northern Maine. The region is more dependent on the commercial recreation and tourism industries than ever, and the importance of preserving and expanding opportunities for these industries to grow should be prioritized throughout this process.

While the Licensee asserts that whitewater boating locally and nationally is in decline, and our experience has been that the number of rafting trips per year in the region has been volatile over the past few years, due in large part to the Covid-19 pandemic, recently there has been renewed interest in outdoor activities and exploration of our natural environment. The industry is still running between 7,000-10,000 rafting trips per year on the West Branch of the Penobscot River, and every effort should be made to preserve and enhance this important industry through this FERC relicensing process.

## Conclusion

MEPRO thanks FERC for the opportunity to provide comments in this proceeding. We look forward to working with all stakeholders to ensure that the relicensing of the Projects maintain and enhance the expectation that Project owners partner with other river users as responsible stewards, maximizing the opportunities for commercial and noncommercial use of and access to this important natural resource.

**MEPRO Members**
Northern Outdoors, Inc.
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New England Outdoor Center, Inc.

Kimberly D. Bose, Secretary
Federal Energy Regulatory
Commission 888 First Street,
Washington, DC 20426

July 9, 2023

**Via Electronic Filing**

Dear Secretary Bose:

**RE: Complaints and Comments in Response to the Environmentally Diasterous McKay Station Outage and the failure of Emergency Outage Measures of July 7, 2023 (FERC No. 2572-133)**

ON July 7, 2023 at 7 PM the Brookfield Website listed a McKay Station (McKay) flow of 100 cfs (see photo below). At 9:47 this website continued to list the McKay flow as being 100 cfs and campers reported the flow remained low at 11 PM. The extent and exact reason for this catastrophic outage is unknown at this time.

While this outage may have been a result of conditions beyond the licensee's control, the response was surely within the Licensee's control. It is ridiculous for a multi-million dollar corporation not to have in place a back–up generator with an automatic switch capable of opening a gate at Ripogenus Dam "not if but when" there are problems at McKay. Seemingly every small business and many home owners in rural Maine have back-up generation fueled by propane which kicks instantaneously on when the power-line flow kicks off. These cost less than $10,000 installed for 20Kw capacity. I have no idea how many kW is needed to lift a gate a Rip Dam – 2x, 3x, maybe 10x. That would be $100,000, a small, in fact teeny price to mitigate the cost to the environment caused by draining a river. FERC must act.

Any McKay outage has major impacts of fish and aquatic communities. However, this extreme (100 cfs), extended (four plus hours) event was particularly devastating to recently emerged alvin (salmon recently exiting the redd) as well as the biologically active aquatic insect communities. Poor turbine design and maintenance as well the Licensee's gate opening response is not acceptable and FERC should act to prevent prolonged McKay outage events in the future.

Historically Great Northern Paper housed a "dam tender" at Ripogenus Dam. The operator's responsibilities included checking water levels and making gate changes at upstream impoundments. Typically, the dam tender completed his duties by early afternoon and was available for emergency Ripogenus Dam gate changes. As a cost saving measure, the Dam Tender position was abounded circa 2000 and a layer of environmental protection lost.

The outage of July 7 demonstrates two shortcoming of the Licensee's emergency flow management at McKay Station. The Licensee failed to maintain the "trip" mechanism that allows 500 cfs of flow though McKay turbines. Then to further exasperate the situation, the response time of the traveling crew was at least four hours. This long delay was also avoidable.

The October 2022 Outage Study (Appendix F, Initial Study Report) provided impacts of a 500 cfs flow. At a flow of 100 cfs, the July 7, 2023 event is much more extreme. The timing of this diasterous outage could not be worse as it occurred during the peak fish and aquatic growing season and a prime angling period and it occurred during daylight hours. Recently emerged alvin (larval salmon) are extremely vulnerable to rapid flow change and the initial dewatering and subsequent flooding of the riverbed. The Holbrook Spawning, Incubation, and Nursery Channel (Article 406) would have been completely dewatered during this four-hour plus event. Essentially the entire West Branch 2023 salmon year class was eliminated. Salmon parr, typically age I fish, are more mobile, it is likely a few ages I and older parr survived.

Aquatic insects are immobile and cannot escape or survive a four-hour period of 100 cfs flow. Beginning in July the adult and sub-adult salmon population become concentrated in the upper 1 ½ mile river reach below McKay Station. There are few, if any smelt, exiting McKay Station. The sub-adult and adult salmon surviving this event will be left without their normal summer maintenance diet of aquatic insects. Growth of surviving fish will diminish as will the survival of undernourished fish.

While anglers are not a direct component of environment disasters, fishing is a traditional part of McKay operations. The 1996 EIS referred to West Branch fishing downstream of McKay Station as high quality. Anglers will not continue to fish locations where there are no or few fish. The July 7, 2023 outage impact on angling remains to be determined. The loss of fishing opportunity and concurrent camping activities at local lodges, camps, and campgrounds as well as the Millinocket area economy are factors yet to be determined.

FERC has the ability to prevent and/or minimize future catastrophic flow interruptions caused by outages. Long-term and short-term mitigation measures are needed. Initially, FERC should order that a McKay Dam Tender position be created and staffed during the aquatic growing season, housing is readily available. Secondly, McKay Station emergency flow mechanism should be "reengineered" and maintained. Thirdly, during the ongoing licensing, the appropriate emergency outage

flow should be determined as well as methods of delivering that flow to the river. Long term mitigation is needed to rebuild salmon stocks, notable the loss of 2023 hatchlings (alvin) and aquatic insects. This can be accomplished by requiring minimum flows of 2200 cfs accompanied by requiring the Licensee to follow a Ripogenus Impoundment storage curve that guarantees storage will be available to meet the year-long minimum flow goal

The Preliminary Application Document and Notice of Intent boasts of Protection, Mitigation and Enhancement (PME) measures provided by project operations. The July 7, 2023 outage event eliminated many of the PME measures, impacts on salmonid populations will likely last for several years. FERC should hold the Licensee accountable to standards they tout so often.

I urge FERC to act and provide fish and aquatic communities of the West Branch below McKay Station with protection now and in the future, against environmentally catastrophic outages such as those witnessed and recorded on July 7, 2023.

Thank you for the opportunity to comment and make suggestions.

Ed Spear
307 Mt Hope Ave
Bangor, Me O4401
207-217-4288

CC; Ms. Alicia Butner  Via Email

The Big Eddy on July 7, 2023 at 7 PM



Jeffrey Scott Murphy, Orono, ME.
National Marine Fisheries Service's Greater Atlantic Regional Fisheries Office supports the ramping study requested by the Maine Council of Trout Unlimited (TU) on July 5, 2023. Analysis of the Licensee's hourly flow data by us (which were included TU's comments) clearly demonstrates that operations have changed since the previous relicensing and that peaking is occurring. Peaking operations can negatively impact both resident and migratory fish species through stranding and direct mortality, and through declines in the macroinvertebrate community. Thus, NMFS urges the Commission to approve TU's request for a ramping study in the West Branch of the Penobscot River downstream of McKay Station.

Kimberly D. Bose,
Secretary
Federal Energy Regulatory
Commission 888 First Street,
Washington, DC 20426

July 20, 2023

**Via Electronic Filing**

RE; Project No 2458-247 The Historic West of the Penobscot River Channel Below Stone Dam. Staff Comments on the Initial Study Report and Initial Study Report Meeting Summary, No 5, Instream Flow and Habitat Assessment Study (Stone Dam).

Dear Secretary Bose:

FERC Staff comments of July 6, 2023 requested studies of the Historic West Branch Channel (Channel) below Stone Dam be expanded to include "f*ishability (i.e., the potential for anglers to safely wade and fish) of the reach at the range of flows modeled (0 to 2,000 cfs)."* I concur and support Staff's request and suggest that studies or plans be expanded. I would like the study to include how anglers would 1) reach the Channel and then 2) move up and down the Channel to fish. Support for my request is explained below.

The Historic West Branch Channel is wider and features run and riffles and is very much UNLIKE Millinocket Stream. The Licensee is suggesting a duplication of the failed Article 413 plan that requires Millinocket Stream May and September stocking of "3 to the pound" adult brook trout. On numerous occasions the Licensee has failed to meet time or trout size criteria required by Article 413. Source fish will remain a problem.

As a 1996 license requirement, then Great Northen Paper (GNP) surveyed anglers fishing Millinocket Stream in the late 90's (see archival GNP files). Much of Millinocket Stream is bracketed by access roads leading to Millinocket Lake. In many cases subsequent stream access is 100-200 feet from these well-traveled roads. During the initial period (Circa 1997) of this enhancement measure GNP was able to obtain source trout from a private hatchery. Despite all the favorable conditions listed above, angler activity lasted one to two weeks.

There are no available/passable roads to the historic West Branch Channel and no trails or foot paths once the Channel is reached by vehicle or boat. In areas the stream bank is covered by boulders, several areas are steep sided. From experience, it is not easy walking up and down the 2 ½ mile reach. Both the channel configuration and river bank are very much unlike Millinocket Stream.

I urge FERC Staff to include an angler access component to the Fishability Study. Additional information should include possible vehicle routes to the site area, Stone Dam, as well trails or foot paths along both sides to the West Branch Channel. Historically Millinocket Stream was stocked in five locations, the access study report should include potential trout stocking locations and discussion of how the hatchery truck will reach these locations in the absence of passable roads.

Additionally, the availability of trout raised in private hatcheries appears to be a problem. In recent years, MeDIFW has provided Millinocket Stream trout, the size and timing of these stocking has failed to meet Article 413 requirements. Is the Licensee paying MeDIFW to stock trout? The Licensee should explain the practically and costs of meetings Brook trout stocking goals.

The Licensee is attempting to reduce future License 401 Water Quality Certificate flow requirements in the historic West Branch Channel. The initial suggestion was a “Field of Dreams” stocked brook trout proposal doomed to failure. Agencies, stakeholders, and FERC Staff need a complete record of the historic West Branch Channel study results that provides information on aquatic habitat as well as fishing and boating opportunities. Angler fishability as well as angler and vehicle access information need to be included in that record.

Thank you for the opportunity to comment and make suggestions.

Ed Spear
307 Mt Hope Ave
Bangor, Me O4401
207-217-4288

July 25, 2023

Ms. Kimberly D. Bose
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

TROUT UNLIMITED
MAINE COUNCIL

**Via online submission to: http://www/ferc.gov**

Subject: **Comments of Maine Council of Trout Unlimited on the Flow Excursion Report Submitted on July 21, 2023 for the Ripogenus Project, Project Number P-2572**

Dear Secretary Bose:

On behalf of its six chapters and over 2,000 members, Maine Council of Trout Unlimited (TU) submits these comments on the Flow Excursion Report for the Ripogenus Project (P-2572) filed for Great Lakes Hydro America, LLC by Brookfield Renewable ("Brookfield" or "Applicant") submitted on July 21, 2023. With two generators put out of commission at McKay Station, this must be considered a serious event that deserves FERC's full attention. Given the strandings and mortality documented by the Brookfield Stranding Study conducted on October 5, 2022[1] incident to the ongoing relicensing of the project that were confirmed and documented by TU volunteers,[2] consequences to the aquatic resources downstream are a serious concern to TU, its membership and Maine's public.

The outage that initiated the chain of events addressed by Brookfield's report was described by Ed Spear in his July 19, 2023 filing: "On July 7, 2023 at 7 PM the Brookfield Website listed a McKay Station (McKay) flow of 100 cfs (see photo below). At 9:47 this website continued to list the McKay flow as being 100 cfs and campers reported the flow remained low at 11 PM."[3] This filing was based on Brookfield's own data and was confirmed by observers. Rather than address this in the flow excursion report as would be expected and as Brookfield has done for trip events in the past, the report terms the event a "Whitewater Recreation Flow Excursion" in its Subject block and proceeds to describe the lesser flow excursion of 1373 cfs that occurred the following day. The report refers to the trip event of July 7 in an attached email message.

The report states that the events of July 8 were a violation of license terms and conditions but the attached email says that the events of July 7 were not. This is a determination that is the prerogative of the Commission, not the licensee - one that should be based on the best information available.

Concentrating on the whitewater recreational flow excursion that occurred on July 8, the report provides graphical generation data documenting the event. Since there is no USGS flow gage below McKay Station in the West Branch of the Penobscot, inferred flows from generation data are the best quantitative information available. The attached email concerning the July 7 event says outage flows

[1] Initial Study Report, Ripogenus Hydroelectric Project (FERC No. 2572), Penobscot Mills Hydroelectric Project (FERC No. 2458), Great Lakes Hydro America, LLC, Millinocket, Maine dated April 24, 2023, Appendix E.
[2] Maine Council of Trout Unlimited letter dated October 19, 2023, Subject: Report of Observations on Ripogenus Project Fish Stranding Study.
[3] Ed Spear Letter dated July 19, 2023, Subject: RE: Complaints and Comments in Response to the Environmentally Diasterous McKay Station Outage and the failure of Emergency Outage Measures of July 7, 2023 (FERC No. 2572-133).

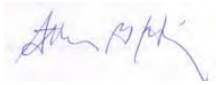
occurred without providing the flow rate, duration, or graphic flow data as was provided for the July 8 flow excursion. Brookfield continues to withhold critical flow information as well as deep gate changes.

**We ask that FERC require that Brookfield submit similar generation data graphics for both July 7, 2023 and July 8, 2023 in their entirety, accompanied by a chronological narrative of the events that occurred during that timeframe.**

This is not the first time that a major malfunction has occurred at McKay Station under Brookfield ownership. A somewhat similar event occurred on June 13, 2015 that was the object of FERC scrutiny that also necessitated use of the deep gates of Ripogenus Dam to maintain flows. Brookfield reported that the problem had been corrected.[4] At the ISR Meeting held last May, Brookfield stated that the project now provided 500 cfs trip flows that exceed the 400 cfs license requirements. This calls the issue into serious question and warrants revisiting by the Commission.

TU has on multiple occasions asked for a schematic of the design of the McKay Station generation facility and reiterates that request.

Respectfully,



Stephen G. Heinz
Maine TU Council FERC Coordinator

Email copy to: Alicia Burtner, FERC Compliance

[4] Brookfield letter dated January 7, 2016, RE: Ripogenus Project 2572, Article 402 Compliance; Follow-up to June 13, 2015 Flow excursion due to McKay Station outage. FERC Document Accession #: 20160107-5108.

Kimberly D. Bose, July 28, 2023
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Dear Secretary Bose, Via Electronic filing

Subject: Project 2572 Response to Great Lake Hydro America filing: 20230721 Ripogenus Project P-2572; July 8, 2023 Whitewater Recreation Flow Excursion Report

On July 7, 2023 the water all but stopped flowing for 22 miles below McKay Station on the West Branch of the Penobscot River (West Branch). Brookfield's Safewaters website listed McKay Flows at 100 cfs at 7 PM. The current Licensee, Great Lakes Hydro America, is entrusted with the management of this precious public resource. Two weeks after this event, the Licensee filed a letter on July 21, 2023 that mentioned the July 7th lighting strikes but dealt with the July 8th impacts to boating that resulted from flow excursions below McKay Station on the West Branch.

The above referenced recreation flow excursion report is an attempt to obfuscate damage to fish and aquatic communities during the outage of July 7, 2023. The report dealt with a two hour impact on boaters rather than the four plus hour impact to fish and aquatic communities, ie., recently emerged landlocked salmon (salmon) and adult salmon summer food source; caddis, mayflies, and stoneflies. Photos and reports from campers along the river indicated flows remained low at 11 PM on July 7th. The impact to fish and aquatic communities will be long lasting. On the morning of July 8th a boater reported approximately 10 dead sub adult salmon in a small pool on the edge of the McKay Station. Other mortalities were likely concealed by nighttime darkness.

The Licensee's account of July 7th is rather confusing. I struggle to understand how "*all of GLHA's hydro stations on the Penobscot River tripped offline due to a lightning strike to the local utility's (Versant Power's) transmission line*." could destroy two McKay Station turbine 30 miles upstream. Bearing oil seems to be a focus of the outage. It would be helpful if a recent maintenance schedule could be provided. The Licensee fails to mention the implementation, if any, of emergency McKay turbine outflow or how that flow was provided with two disabled turbines. The Licensee has provided graphic West Branch flow details of July 8th. They should do the same for July7th beginning at 3PM.

In pleading guilty to a two hour interruption in boating flows the Licensee attempts to deflect attention away from the more environmentally disastrous, four plus hour, low flow event, that impacted the West Branch salmon fishery and aquatic communities. The Licensee's July 21, 2023 filing fails to mention the time the trip event began (an attached July 10 Email from K. Bernier states the outage began at 1759 h), when deep gates were opened, and why McKay Station energy outage flow measures appeared to fail. Rather than discuss environmental and recreational impacts, the Licensee goes into great details concerning turbine damage. Outages are an annual event. The magnitude and duration of the July 7th event is historic.

The Licensee has yet to file a July 7th outage report. The July 21, 2023 filing is a separate event and deals with <u>boating flow excursions on July 8</u> rather July 7, the day of the lighting strike(s). In addition to a July 7th outage report that includes flow over time, a second report that deals with the dewatering of the Holbrook bypass stream (article 406) needs to be filed. The loss of the 2023 (young-of-the-year) salmon age class, produced by this mitigation measure, will impact the West Branch salmon population for several years

The apparent response time of the Licensee on July 7th is inexcusable as is the failure to have auxiliary generators in the Ripogenus Dam Gate house capable of lifting a deep gate during emergency outages. Technologies such as automatic transfer switches which sense power failure in line supply and switch to back-up sources and Liquid Propane-fired back up generators are available. Beginning on June11, 2021 with the Pre-Application Document the Licensee has touted protection, mitigation, and enhancement measures (PM&E). The diasterous event of July 7th produced a trifecta of failed PM&E measures.

A complete factual accounting of flows over time and Ripogenus Dam gate changes during the July 7th outage is needed in order to assess "lighting strike" impacts. The agencies, stakeholders, and FERC need a full accounting of the events of July 7, 2023. The Licensee should make this information available in a timely manner.

The loss of West Branch flow on July 7, 2023 is an actionable event. Fish and aquatic communities were impacted. Due to low flow conditions boaters and anglers lost time on the river. The Ripogenus Impoundment, Ripogenus Dam, McKay Station and downstream West Branch make up the Licensee's Ripogenus Project. Environmental and recreational disasters are the Licensee's responsibility. The Licensee needs to be held accountable. FERC has an opportunity to prevent this going forward in the ongoing (re) licensing. In the meantime, FERC compliance staff should require fish and aquatic communities' mitigation and issue civil penalties significant enough to get the attention of the leadership of this huge multinational enterprise.

Thank you for the opportunity to comment. I urge FERC to take quick and decisive action.

Ed Spear

307 Mt Hope Ave.
Bangor, Me 04401
Email: edspear1@yahoo,com
Phone: 207-217-4288

Brookfield
Renewable

August 1, 2023

***Via Electronic Filing***

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Third Study Progress Report**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), Licensee of the Ripogenus Hydroelectric Project (FERC No. 2572) and the Penobscot Mills Hydroelectric Project (FERC No. 2458) (collectively referred to as the "Projects"), herein files with the Federal Energy Regulatory Commission ("FERC" or "Commission") the Third Study Progress Report for the relicensing of the Projects. The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot counties, Maine.

The current licenses for the Projects were issued on October 22, 1996 and expire on September 30, 2026. On June 11, 2021, GLHA filed the Notices of Intent and Pre-Application Document, which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through the Commission's Integrated Licensing Process (ILP). On March 23, 2022, GLHA filed a Revised Study Plan (RSP) for the Projects, and the Commission issued the Study Plan Determination (SPD) on May 13, 2022.

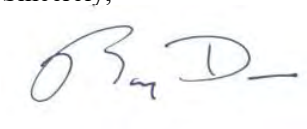
Pursuant to the RSP, GLHA herein submits the Third Study Progress Report for the period from May 1 through July 31, 2023 for the Projects. The enclosed table (report) provides a list of the required studies and associated status of progress, as well as any modifications to the approved methodologies.

Concurrent with this filing, GLHA is providing a copy of this letter to all parties listed in the attached distribution list. A copy of the Third Study Progress Report can be downloaded from FERC's eLibrary system at https://www.ferc.gov/docs-filing/elibrary.asp by conducting a search using the docket numbers p-2458 and/or p-2572.

Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462
www.brookfieldrenewable.com
Tel: 207.723.4341
Fax: 207.723.3948

If you have any questions regarding this letter, please contact me by phone at (207) 775-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman
Licensing Manager
Brookfield Renewable

cc: Distribution List

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

**Federal Agencies**

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Stephanie Carman
Acting District Manager
Northeastern States
Bureau of Land Management
626 E. Wisconsin Avenue, Suite 200
Milwaukee, WI 53202-4617

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Kimberly Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Karen McGuire
New England Region 1
Deputy Regional Administrator
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

**State Agencies**

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Kyle Olcott
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Peter Jamieson
Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
40 Western Avenue
E.S. Muskie Federal Building, Room 412
Augusta, ME 04330

Stacey Guerin
State Senator
3 State House Station
Augusta, ME 04333

Kathy Irene Javner
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, Maine 04333

Trey Stewart
State Senator
3 State House Station
Augusta, ME 04333

James Lee White
State Represenative
House Minority Office
Room 332, State House
2 State House Station
Augusta, ME 04333-0002

**Native American Tribes**

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Rena Newell
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

**Additional Parties**

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground
ssindo@chewonki.org

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund
sperry@maine.com

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Kelly Maloney
Manager
Great Lakes Hydro America LLC
150 Main Street
Lewiston, ME 04240

Jesika Lucarelli
Great Mountain Guide Service
greatmountaings@gmail.com

Mark Nadeau
International Association of Machinists
245 Pamola Park
Millinocket, ME 04462

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Director
Maine Professional River Outfitters
PO Box 669
Millinocket, ME 04462-0669

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing
mary@mxhmarketing.com

Matt Polstein
New England Outdoor Center
matt.polstein@gmail.com

Michael Smith
Outdoor Sport Institute
176 Highland Ave
Millinocket, ME 04462

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Allison Economy
Representative for Allagash Gateway
Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Thomas Nannery
Sportsman's Alliance of Maine
205 Church Hill Rd
Augusta, ME 04330-9801

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Jeffrey Reardon
Maine Brook Trout Project Director
Trout Unlimited
267 Scribner Hill Road
Manchester, ME 04351

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,
sharon.klein@maine.edu

Dean Beaupain
dean@bloomerrussell.com

Jeff Fayle
jfayle@gmail.com

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti
granby@cox.net

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris
nsharris@mgh.harvard.edu

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Christopher Howe
funpow89@yahoo.com

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

# THIRD STUDY PROGRESS REPORT

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>Third Study Progress Report<br>(May 1, 2023 through July 31, 2023) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 1a | Water Quality Study – Impoundment Lake Trophic Assessment | Study completed as required in 2022 with study results provided in the ISR. | None. |
| 1b | Water Quality Study – Downstream DO/Water Temperature Assessment | Study completed as required in 2022 with study results provided in the ISR. | • Additional water temperature data are being collected at three monitoring sites in the West Branch downstream of Stone Dam in June and July 2023 based on comments from MDIFW during the ISR Meeting.<br>• Data collected in 2023 will be provided in the USR. |
| 1c | Water Quality – Benthic Macroinvertebrate Assessment | Study completed as required in 2022 with study results provided in the ISR. | • Additional macroinvertebrate data is being collected at two locations in the West Branch downstream of Stone Dam.<br>• Data collected in 2023 will be provided in the USR. |
| 1d | Water Quality – Impoundment Aquatic Habitat Assessment | Study completed as required in 2022 with study results provided in the ISR. | None. |
| 1e | Water Quality – Riverine Aquatic Habitat Assessment | Study completed as required in 2022 with study results provided in the ISR. | None. |
| 2 | Instream Flow and Habitat Assessment of West Branch below Stone Dam | Study completed as required in 2022 with study results provided in the ISR. | None. |
| 3 | Fish Assemblage Survey Study | Study completed as required in 2022 with study results provided in the ISR. | None. |

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>Third Study Progress Report<br>(May 1, 2023 through July 31, 2023) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 4 | Fish Stranding Study | Study completed as required in 2022 with study results provided in the ISR. | None. |
| 5 | North Twin Impoundment Tributary Access Survey | Pursuant to the RSP and SPD:<br>• Based on the consultation with MDIFW, tributary surveys were performed in mid-July 2022, but the fall 2022 survey could not be performed due to wet weather and high impoundment elevations.<br>• The fall tributary survey is anticipated to be performed in October 2023, pending suitable field conditions. | None. |
| 6 | Upstream American Eel Passage Assessment Study | Study completed as required in 2022 with study results provided in the ISR. | • Based on comments received at the ISR meeting, in consultation with USFWS, MDMR, MDIFW, and PIN, GLHA has initiated nighttime eel observations and electrofishing surveys at the Dolby, Millinocket (Stone Dam), North Twin, and Millinocket Lake Storage Developments. However, heavy precipitation experienced in June and July 2023 have resulted in high flows in the rivers and spill conditions at the dams, limiting the ability to perform the nighttime eel observations and electrofishing so far, this season. Pending reasonable flow conditions, efforts will be made to continue nighttime eel observations and electrofishing in August and September.<br>• Data collected in 2023 will be provided in the USR. |
| 7 | Desktop Downstream Eel Passage Route and Survival Study | Study completed as required in 2022 with study results provided in the ISR. | None. |

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>Third Study Progress Report<br>(May 1, 2023 through July 31, 2023) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 8 | Recreation Study | Portions of the study were completed in 2022 with study results provided in the ISR.<br>• Because of atypical conditions at three sites in 2022, GLHA is collecting additional recreation user spot/calibration counts at the two Dolby Development recreation sites and the Green Bridge Boat Launch.<br>• Data collected in 2023 will be provided in the USR. | • Based on comments received at the ISR meeting, GLHA has redeployed the recreation user survey boxes and QR codes at most of the FERC-approved Project recreation sites throughout the Projects to collect additional survey data in 2023 and early 2024.<br>• GLHA plans to convene a recreation and access focus group to obtain additional site-specific recreation and informal access information and concerns from interested stakeholders.<br>• Data collected in 2023 will be provided in the USR. |
| 9 | Whitewater Boating Assessment Study | Study completed as required in 2022 with study results provided in the ISR. | None. |
| 10 | Aesthetic Study | Portions of the study were completed in 2022 with study results provided in the ISR.<br>• GLHA plans to coordinate an aesthetic focus group to obtain additional site-specific information and concerns regarding aesthetics from interested stakeholders.<br>• Data collected in 2023 will be provided in the USR. | None. |
| 11 | Historic Architectural Survey | Study completed as required in 2022 with study results provided in the ISR.<br>• GLHA is in the process of reviewing and addressing comments provided by the Maine Historic Preservation Commission and will provide updated information, as appropriate, in the USR. | None. |
| 12 | Historical Operations Data Assessment Study | Study completed as required in 2022 with study results provided in the ISR. | None. |

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>Third Study Progress Report<br>(May 1, 2023 through July 31, 2023) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 13 | Operations Model Study | Study completed as required in 2022 with study results provided in the ISR.<br>• Based on comments received at the ISR meeting, GLHA is in the process of coordinating an Operations Model Study Technical Conference for interested stakeholders to further discuss the model development, model outputs, and how the model will be utilized during the relicensing proceeding.<br>• GLHA anticipates convening the technical conference in fall 2023.<br>• Subsequent to the technical conference, GLHA will provide stakeholders with a 60-day period for which to provide comments on the operations model and/or submit alternative operating scenarios to be evaluated by the model.<br>• Information presented at the technical conference, stakeholder comments, and the results of the model runs for the requested alternative operating scenarios will be provided in the USR. | None. |

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>Third Study Progress Report<br>(May 1, 2023 through July 31, 2023) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 14 | Wood Turtle Habitat and Presence Evaluation Study | Consistent with the RSP and SPD:<br>• GLHA consulted with the MDIFW in early 2023.<br>• Based on the consultation with MDIFW, wood turtle habitat areas were identified and field surveyed in June 2023.<br>• No wood turtles were found during the field survey events performed in 2023.<br>• Data collected in 2023 will be provided in the USR. | None. |
| 15 | Marsh Bird Survey Study | Consistent with the RSP and SPD:<br>• GLHA consulted with the MDIFW in early 2023.<br>• Based on consultation with MDIFW, marsh bird habitat areas were identified and field surveyed between May 15 and June 30, 2023.<br>• Data collected in 2023 will be provided in the USR. | None. |
| 16 | Furbearer Survey Study | Consistent with the RSP and SPD, the study is anticipated to be completed in 2023 (in consultation with MDIFW) with available data provided in the USR. | None. |
| 17 | Common Loon Management Plan Assessment Study | Study completed as required in 2022 with study results provided in the ISR. | None. |
| 18 | Riparian and Littoral Habitat Assessment Study | Study completed as required in 2022 with study results provided in the ISR. | None. |
| 19 | Terrestrial, Botanical and Wildlife Resources Study | The desk-top portion of the study was completed in 2022 with study results provided in the ISR.<br>• GLHA is in the process of completing the field portion of the study during the growing season in 2023.<br>• Data collected in 2023 will provided in the USR. | None. |

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>Third Study Progress Report<br>(May 1, 2023 through July 31, 2023) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 20 | Environmental Justice Study | Portions of the study were completed in 2022 with study results provided in the ISR.<br>• GLHA is in the process of performing consultation with the PIN as well as additional outreach to members of identified EJ communities.<br>• Data collected in 2023 will be provided in the USR. | None. |

Henry Mitchell, Bowdoinham, ME.
Brookfield Power has shown itself to be a poor corporate citizen, as evidenced by their poor management of the resource and disregard for the environment and the people who recreate and make a living on the West Branch of the Penobscot River.

The July 5 dewatering of the river and its decimation of a year-class of fish due to their poor maintenance, unwillingness o have a dam-keeper on site is just the most recent insult to the river, and to the people of Maine who own its waters.

Cumulatively I have spent more than a year of my life, going back to the late 70s and usually spend 2-3 weeks a year at the Big Eddy campground.

Only since Brookfield took over Ripogenus Dam that I've had to move my campsite or cut my vacation short due to their inept water management. This has happened to me twice, most recently this June. Knowing that the lakes were all full they were still only releasing 3000 cfs from Rip Dam. Then when we got torrential rains there was no buffer. We were told the water was coming up to 5000 cfs and we should move our tents. The next morning we were told it would be coming up to 9000 cfs, completely flooding our campsite as well as making the river unfishable, un-paddleable and unraftable. Another vacation cut short, another uncompensated financial blow to campgrounds, fishing guides and rafting companies.

Brookfield has shown they are not worthy of a license, I urge you not to renew it.

Respectfully, Henry Mitchell, Bowdoinham ME.

Brookfield
Renewable U.S.

August 7, 2023

***Via eFiling***

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Response to Comments on the Initial Study Report and Requests for New or Amended Studies**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), the Licensee of the Ripogenus Hydroelectric Project (No. 2572) and the Penobscot Mills Hydroelectric Project (No. 2458) (collectively referred to as the "Projects"), herein files with the Federal Energy Regulatory Commission (FERC) responses to comments on the Initial Study Report (ISR) and requests for new or amended studies for the Projects. The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot counties, Maine.

On June 11, 2021, GLHA filed the Notices of Intent and a Pre-Application Document (PAD), which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through FERC's Integrated Licensing Process (ILP). On March 23, 2022, GLHA filed the Revised Study Plan (RSP) and on May 13, 2022, FERC issued the Study Plan Determination (SPD).

Pursuant to the RSP, and as modified and approved by FERC's SPD, GLHA performed study activities in 2022 and early 2023. Pursuant to 18 CFR §5.15(c), on April 22, 2023, GLHA filed the ISR describing the overall progress in implementing the study plan, presenting the available study results, and describing variances from the approved plan. Subsequent to filing of the ISR, GLHA held the ISR Meeting with FERC staff and other relicensing participants on May 2, 3, and 4, 2023, in Millinocket, Maine, and filed the ISR Meeting Summary on May 22, 2023.

On May 23, 2023, the National Marine Fisheries Serivce requested an extension of time to file comments on the ISR and requests for new or amended studies. Via order dated June 6, 2023, FERC granted an extension of time, until July 6, 2023, to file comments on the ISR and requests for new or amended studies. FERC's June 6, 2023 order also indicated that GLHA's responses to comments and study requests are due by August 5, 2023[1], and FERC's Study Plan Modification Determination will be issued by September 4, 2023.

[1] August 5, 2023 is a Saturday and, therefore, consistent with 18 CFR §385.2007, GLHA's responses to comments and study requests are due by Monday, August 7, 2023.

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

Comments on the ISR and/or requests for new or amended studies were timely filed by the following stakeholders, copies of which are provided as an attachment to this letter:

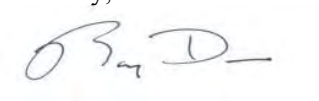
- Federal Energy Regulatory Commission
- National Marine Fisheries Service
- Maine Department of Agriculture, Conservation & Forestry, Bureau of Parks and Lands
- Maine Department of Inland Fisheries & Wildlife
- Maine Department of Marine Resources
- Maine Professional Rafting Outfitters
- Caribou and Chesuncook Lake Camp Owners Association
- Chesuncook Dam Camp Owners Association
- American Whitewater
- Appalacian Mountain Club
- Maine Council of Trout Unlimited
- Edward Spear
- Christopher Howe

GLHA has reviewed the comments on the ISR and requests for new or amended studies as filed with FERC and herein provides responses to these comments and requests.

Concurrent with this filing, GLHA is providing a copy of this letter to all parties listed in the attached distribution list. Parties can download an electronic copy of this filing from FERC's eLibrary system at https://www.ferc.gov/ferc-online/elibrary by conducting a search using the docket numbers P-2458 and/or P-2572.

If you have any questions regarding this filing, please contact me by phone at (207) 775-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman, Licensing Manager
Brookfield Renewable

cc: Relicensing Distribution List

Enclosed: Responses to Comments on the ISR and Requests for New or Amended Studies

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

**Federal Agencies**

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Stephanie Carman
Acting District Manager
Northeastern States
Bureau of Land Management
626 E. Wisconsin Avenue, Suite 200
Milwaukee, WI 53202-4617

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Kimberly Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Karen McGuire
New England Region 1
Deputy Regional Administrator
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

**State Agencies**

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Kyle Olcott
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Peter Jamieson
Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
40 Western Avenue
E.S. Muskie Federal Building, Room 412
Augusta, ME 04330

Stacey Guerin
State Senator
3 State House Station
Augusta, ME 04333

Kathy Irene Javner
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, Maine 04333

Trey Stewart
State Senator
3 State House Station
Augusta, ME 04333

James Lee White
State Represenative
House Minority Office
Room 332, State House
2 State House Station
Augusta, ME 04333-0002

**Native American Tribes**

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Rena Newell
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

**Additional Parties**

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground
ssindo@chewonki.org

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund
sperry@maine.com

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Kelly Maloney
Manager
Great Lakes Hydro America LLC
150 Main Street
Lewiston, ME 04240

Jesika Lucarelli
Great Mountain Guide Service
greatmountaings@gmail.com

Mark Nadeau
International Association of Machinists
245 Pamola Park
Millinocket, ME 04462

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Director
Maine Professional River Outfitters
PO Box 669
Millinocket, ME 04462-0669

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing
mary@mxhmarketing.com

Matt Polstein
New England Outdoor Center
matt.polstein@gmail.com

Michael Smith
Outdoor Sport Institute
176 Highland Ave
Millinocket, ME 04462

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Allison Economy
Representative for Allagash Gateway
Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Thomas Nannery
Sportsman's Alliance of Maine
205 Church Hill Rd
Augusta, ME 04330-9801

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Jeffrey Reardon
Maine Brook Trout Project Director
Trout Unlimited
267 Scribner Hill Road
Manchester, ME 04351

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,
sharon.klein@maine.edu

Dean Beaupain
dean@bloomerrussell.com

Jeff Fayle
jfayle@gmail.com

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti
granby@cox.net

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris
nsharris@mgh.harvard.edu

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Christopher Howe
funpow89@yahoo.com

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

Kimberly D. Bose, August 10, 2023
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Dear Secretary Bose, Via Electronic filing

Subject: Ripogenus Project P-2572. Comments regarding Great Lake Hydro America's April 24, 2023 filing:; Appendix C: Initial Water Quality Study Report

The Licensee proposed, and then during 2022 conducted, water quality studies they hoped would provide information necessary in meeting statutory requirements in the Licensing of the Ripogenus Project and Penobscot Mills Projects. The Report is brief in needed fisheries related details and factually flawed in site locations. The lack of any information describing impoundment planktonic communities remains a major data gap.

As in other studies, the Licensee has sampled and provided interpretations of study results that fit its goals. This strategy is well within their rights as Licensee. It is the agencies, stakeholder and FERC staff that must argue for studies that describe the current status of fish and aquatic communities. Without realistic studies, the degradation of the Ripogenus Impoundment and West Branch of the Penobscot River (West Branch) will continue and the historic West Branch landlocked salmon (salmon) fishery will be a fishery of the past.

Aquatic insects provide food for all salmon life stages and are vital as summer "maintence diet" for adult salmon. Aquatic insect hatches of their former magnitude no longer exist. The Maine Department of Inland Fisheries and Wildlife October 8, 2021 filing states *"We have received anecdotal reports from anglers on the West Branch that insect hatches are less frequent and less intense than in the past. We think it would be prudent if the Licensee repeated the macroinvertebrate studies completed in the river for the current license to determine if any changes have occurred".* We think it would be prudent if the Licensee repeated the macroinvertebrate studies completed for the current license to determine if any changes have occurred. It is difficult to see why MeDIFW's reasonable request not was incorporated into the Water Quality study.

While not part of the Water Quality Study Plans, plankton communi. es continue to be the critical component of the Ripogenus Impoundment biota. Zooplankter, such as rotifers, support rainbow smelt, the key food source of impoundment and downstream salmon populations. Without a description of the Ripogenus Impoundment plankton communities the Maine Department of Environmental Protection will not be able to meet the "as naturally occurring"

or “anti degradation standard”. The 1991 Licensee Ripogenus Project Application contains a full description of the Impoundment’s planktonic communities.

The Licensee’s initial report was disappointing. As in previous studies of project uses, the Licensee alone sampled when, where, and how it collected data. Additionally, Ambejackmockamus Falls site is either miss named or miss located on the site map. This makes comparisons problematic. As with other Licensee studies, more “data gaps” are created rather than filled. While the Licensee states in the June 11. 2021 PAD that new studies are not needed: *“Therefore, GLHA maintains that a full suite of new studies is not needed, that the vast body of information on which today’s certifications and licenses are soundly based and should be relied upon for these relicensings. In addition, consistent with the Commission’s criteria for study requests, the scope and extent of any new study be focused on addressing specific data gaps necessary to inform the development of license requirements”.* This is not supported by the change in operations to a peaking mode

The Initial Water Quality Study Report of April 24, Appendix C provided West Branch of the Penobscot River (West Branch) aquatic communities information. Aquatic insects, namely Ephemeroptera, Plecoptera, and Trichoptera (EPT) are critical to the growth and survival of all West Branch salmon life stages. Additionally, the diversity and abundance of EPT is part of meeting water quality standards. River wide comparisons to 1991 data are impossible.

The basic goals of these studies were only to determine if water quality standards are being met. Studies designed to answer Agency and stakeholder questions regarding change resulting from the shift in Project operation to a peaking mode were not included. The 1991 FERC License Application provides tables demonstrating the abundance of aquatic insects in various river reaches. Additional sampling would allow past (1991 Application) and present (Appendix C) comparison between the abundance of aquatic communities, namely EPT.

The production of diversity and species richness indices are academically interesting. However, such indices do not provide information on the availability of aquatic insects as a food source to salmonid populations. These index tables deflect attention away from the paucity of aquatic insects critical to the West Branch salmonid food chain.

In an attempt to meet Water Quality Certification standards, rather than describe current conditions, the Licensee chose areas and methods NOT comparable to data presented in the 1991 Great Northen Paper License Application. In the draft study Plan, the Licensee proposed the Upper Gorge and Mckay Station as sampling sites. Two sites were added “in the vicinity of the Holbrook Side Channel and at Ambejackmockamus Falls to address the SPD

recommendation from FERC to add two river locations in the reach between McKay Station and Nesowadnehunk Falls."

These sites can be described as:

Upper Gorge; A ledge reach with seasonal flow
McKay Station; A man-made open culvert blasted from ledge
Holbrook Pool: An area bulldozed during the log-driving era
Ambejackmockamus Falls: From the photo on page C-45 it appears the Licensee has erred. The "bullet" on the map appears to be located at or near Little Falls approximately one mile above Big Ambejackmockamus Falls.

Except for one of the confusing "Big A" sites, none of the selected reaches represent the riffle, run, pool areas of the West Branch. These areas provide much of the Spring through Fall salmonid habitat.

Initially the reach below McKay Station was selected as a sampling site. The selection of this open culvert, high velocity area is somewhat of a mystery. Planned sampling was abandoned "GLHA did not perform an initial transect evaluation across the river directly downstream of McKay Station due to unsafe access conditions created by high velocity river flows. In addition, because this river reach is frequently recreated by whitewater rafters and boaters, dataloggers deployed in the center of the river would be in the direct path of boaters, creating an obstruction and safety hazard to boaters and potentially damaging the data logger" (C-32). The excuse provided is nonsensical. Channel configuration and McKay outflows have been on record for 70 years. Boaters and rafters have been present for 30 plus years. The Licensee was fully aware, or should have been fully aware, of these conditions when the McKay Station reach was proposed. The Licensee bares full responsibility for poor site selection and the lack of information from this site.

While this filing contains many high-quality pictures, neither "Holbrook" nor the "Ambejackmockamus" sites were photographed. While GPS coordinates are provided, these site locations need to be provided in "lay terms," photographed. The Licensee is responsible for knowing where they sampled.

Depending on how the text or map is read, the Licensee summarizes aquatic insect collections from either Big Ambejackmockamus Falls or Little Ambejackmockamus Falls, two very different habitats. The Locations are a mile apart as are any comparison with data shown in Tables 34 and 37 (edited) of the 1991 Ripogenus Project Application and the Licensee 2022 data. The number of Trichoptera taxa reported in Appendix C (Table 5.2 -30) is five as opposed to eight taxa reported in the 1982 sample. EPT species consisted of 11.6% of the Licensee's 2022 sample as opposed to an average of 45% in the May, June, sampling of 1982 (Table 37, 1991 Rip Application). A reasonable conclusion is that present project peaking operations have

degraded both species composition and abundance. The Licensee states “nothing has changed” (since the change in project ownership) in Project operations and river flow management. Notwithstanding the absurdity of this claim, how does the Licensee explain the change in taxa? The burden of proof lies with the Licensee. To date, fragmental data presented in Appendices three and four suggest a degraded fish and aquatic community in both the Ripogenus Impoundment and downstream West Branch.

TABLE 34. BENTHIC MACROINVERTEBRATE PERCENT COMPOSITION (%) AND DENSITY (INDIVIDUALS . $m^{-2}$) COLLECTED WITH SURBER SAMPLER IN 1981 SAMPLING PERIODS, WEST BRANCH OF THE PENOBSCOT RIVER, PISCATAQUIS COUNTY, MAINE.

| TAXA | BIG EDDY | | | | | BIG "A" FALLS | | | HORSERACE | ABOL | POCKWOCKAMUS | DEBSCONEAG | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NEARSHORE | | MID-CHANNEL | | | NEAR-SHORE | | | MID-CHANNEL | MID-CHANNEL | MID-CHANNEL | NEAR-SHORE | | | |
| | MAY | JUN | JUN | JUL | SEP | MAY | JUN | SEP | JUL | SEP | SEP | MAY | JUN | JUL | SEP |
| PERCENT* | | | | | | | | | | | | | | | |
| Oligochaeta | 70.8 | 9.3 | 9.9 | 5.5 | 3.9 | 40.7 | 13.3 | 9.2 | 6.9 | 6.4 | 5.5 | 21.1 | 8.8 | 7.5 | 3.4 |
| Pelecypoda | 0.0 | 0.0 | 3.6 | 13.9 | 3.4 | 6.2 | 20.9 | 20.9 | 19.4 | 20.9 | 10.7 | 31.5 | 8.4 | 20.6 | 58.1 |
| Ephemeroptera | 2.6 | 33.6 | 26.7 | 26.0 | 17.1 | 20.8 | 36.0 | 11.2 | 31.9 | 8.6 | 4.9 | 24.7 | 15.9 | 5.9 | 3.4 |
| Odonata | 0.0 | 0.0 | 0.5 | 1.1 | 0.3 | 0.0 | 0.0 | 0.1 | 0.3 | 0.2 | 0.3 | 0.0 | 0.0 | 0.1 | 0.0 |
| Coleoptera | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.0 | 1.5 | 1.0 | 0.3 | 7.1 | 7.7 | 1.4 | 0.2 | 4.4 | 1.6 |
| Trichoptera | 1.6 | 4.2 | 35.4 | 38.2 | 62.9 | 11.9 | 11.6 | 41.9 | 22.6 | 25.6 | 33.5 | 5.8 | 0.7 | 7.8 | 11.8 |
| Diptera | 14.6 | 40.9 | 12.6 | 5.9 | 6.4 | 12.1 | 7.8 | 6.8 | 11.8 | 24.8 | 26.6 | 7.6 | 63.8 | 50.7 | 9.6 |
| Megaloptera | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 0.3 | 1.7 |
| Plecoptera | 0.3 | 0.6 | 1.0 | 2.2 | 0.2 | 2.3 | 1.1 | 0.9 | 4.2 | 1.7 | 0.4 | 5.8 | 1.1 | 0.8 | 0.1 |
| Other | 10.1 | 11.5 | 10.2 | 3.2 | 5.6 | 5.9 | 7.8 | 9.2 | 2.4 | 4.7 | 10.0 | 2.0 | 3.1 | 1.9 | 8.5 |
| All | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| DENSITY* | | | | | | | | | | | | | | | |
| Oligochaeta | 782.2 | 168.6 | 663.8 | 233.2 | 358.8 | 636.7 | 261.9 | 488.0 | 147.1 | 93.9 | 143.5 | 326.7 | 462.9 | 384.7 | 116.8 |
| Pelecypoda | 0.0 | 0.0 | 240.4 | 674.3 | 330.1 | 96.9 | 412.6 | 1112.3 | 412.6 | 305.0 | 279.9 | 363.3 | 444.9 | 1087.2 | 1932.5 |
| Ephemeroptera | 28.7 | 610.0 | 1783.2 | 1101.5 | 1582.3 | 326.5 | 710.4 | 599.2 | 678.1 | 125.6 | 129.2 | 441.3 | 732.0 | 312.2 | 114.8 |
| Odonata | 0.0 | 0.0 | 35.9 | 46.6 | 28.7 | 0.0 | 0.0 | 3.6 | 7.2 | 3.5 | 7.2 | 0.0 | 0.0 | 3.6 | 0.0 |
| Coleoptera | 0.0 | 0.0 | 7.2 | 3.4 | 3.6 | 0.0 | 28.7 | 100.5 | 7.2 | 104.1 | 200.9 | 25.1 | 10.8 | 229.6 | 53.8 |
| Trichoptera | 17.9 | 75.3 | 2564.5 | 1618.2 | 5812.6 | 186.4 | 229.6 | 2231.7 | 480.8 | 373.2 | 875.5 | 104.1 | 35.9 | 409.0 | 459.3 |
| Diptera | 161.5 | 742.7 | 843.2 | 253.2 | 592.0 | 190.2 | 154.3 | 354.7 | 251.2 | 362.4 | 696.1 | 136.3 | 3369.1 | 2669.5 | 212.2 |
| Megaloptera | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.2 | 0.0 | 0.0 | 10.8 | 0.0 | 0.0 | 17.9 | 57.4 |
| Plecoptera | 3.6 | 10.8 | 68.2 | 93.3 | 14.4 | 35.9 | 21.5 | 46.6 | 89.2 | 25.1 | 10.8 | 104.1 | 52.4 | 43.1 | 3.6 |
| Other | 111.2 | 208.1 | 681.7 | 218.9 | 520.3 | 93.3 | 154.3 | 488.0 | 50.2 | 68.2 | 861.9 | 35.9 | 165.0 | 100.5 | 281.1 |
| All | 1105.1 | 1815.5 | 6688.0 | 4261.0 | 9242.7 | 1568.0 | 1973.4 | 5331.8 | 2124.1 | 1460.3 | 2615.7 | 1786.8 | 5277.9 | 5267.2 | 3336.8 |

*represents a mean of three replicates

Table 37 Benthic Macroinvertebrates Collected in Drift Nets Samples from the West Branch of the Penobscot River, Piscataguis County, Maine 1981 -Modified by the author to highlight the Trichoptera Taxa

| | Little A Falls Pool | | | Neso. Deadwater | | | Debsconeag Deadwater | | |
|---|---|---|---|---|---|---|---|---|---|
| Adult** | P | P | P | P | P | P | P | P | P |
| Pupae** | P | P | P | P | P | P | P | P | P |
| Larvae | | | | | | | | | |
| Chaoboridae | | | | | | | | | |
| Chaoborus sp. | | P | P | | | | | | |
| Ceratopogonidae | | | | | | | | P | |
| Chironomidae** | P | P | P | P | P | P | P | P | P |
| Empididae | | | | | P | P | | P | |
| Hemerodromia spp. pupae | | | | | P | | | P | |
| Tabanidae | | | | | | | | | |
| Pupae | | | | | | | | P | |
| Antocha sp. | | | P | P | P | P | | | |
| Tipula sp. | | | P | | | | | | |
| Trichoptera (Caddisflies) | | | | | | | | | |
| Adults | | P | P | | P | | P | | |
| Pupae | | P | | P | P | | | P | |
| Brachycentridae | | | | | | | | | |
| Micrasema sp. | | | | P | P | P | P | P | |
| Glossosomatidae | | | | | | | | | |
| Protoptila sp. | | P | | | P | | | | |
| Hydropsychidae | | P | | | | | | | |
| Cheumatopsyche spp. | | | P | P | P | P | | | |
| Hydropsyche spp. | | | P | P | P | P | | | |
| Hydroptilidae | | | | | | | | | |
| Hydroptila sp. | | | P | P | P | P | | | |
| Oxyethira sp. | | | P | | | | P | | P |
| Lepidostomatidae | | | | | | | | | |
| Lepidostoma sp. | | | | P | | | | | |
| Leptoceridae | | | | | P | | P | P | |
| Ceraclea sp. | | | | | P | P | | P | |
| Nectopsyche sp. | | | | | | | | P | |
| Oecetis sp. | | | | P | | P | | | |
| Philopotamidae | | | | | | | | | |
| Chimarra sp. | | | | P | P | | | | |
| Polycentropodidae | | | | | | | | | |
| Polycentropus sp. | | | | | P | P | | | |
| Psychomyiidae | | | | | P | | | | |
| Fish Larvae | | | P | | P | | | | |
| Number of Taxa | | 11 | 11 | 20 | 30 | 16 | 25 | 19 | 27 | 13 |

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**Table 5.2-30 Summary of benthic macroinvertebrate community rock basket metrics for replicates collected at the Ambejackmockamus Falls sampling location**

| Community Metric | Replicate 1 | 2 | 3 | All |
|---|---|---|---|---|
| Total Number of Individuals | 129 | 126 | 142 | 397 |
| Total Number of Taxa (genus level) | 18 | 17 | 8 | 29 |
| Number of EPT Taxa (genus level) | 8 | 6 | 4 | 11 |
| Number of Ephemeroptera Taxa (genus level) | 4 | 2 | 2 | 5 |
| Number of Plecoptera Taxa (genus level) | 0 | 0 | 1 | 1 |
| Number of Trichoptera Taxa (genus level) | 4 | 4 | 1 | 5 |
| Percent EPT Specimens | 48.8% | 32.5% | 6.3% | 28.5% |
| Percent Ephemeroptera Specimens | 21.7% | 9.5% | 4.2% | 11.6% |
| Number of Intolerant Taxa (genus level) | 4 | 4 | 1 | 8 |
| Number of Intermediate Taxa (genus level) | 9 | 5 | 2 | 12 |
| Number of Tolerant Taxa (genus level) | 2 | 2 | 3 | 3 |
| Percent Intolerant Organisms | 10.9% | 5.6% | 1.4% | 5.8% |
| Percent Intermediate Organisms | 41.9% | 12.7% | 4.2% | 19.1% |
| Percent Tolerant Organisms | 8.5% | 18.3% | 2.8% | 9.6% |
| Percent Dominant Taxon (genus level) | 24.8% | 28.6% | 90.1% | 49.4% |
| Hilsenhoff Biotic Index | 4.86 | 5.67 | 4.58 | 5.11 |
| Shannon Diversity (base e) | 2.41 | 2.15 | 0.51 | 2.11 |

A sampling scheme designed to duplicate Table 35 as well as Tables 34 and 37 would determine the present abundance of aquatic insects critical to salmonid management. The results of new sampling could meet the “naturally occurring” standard met in the 401 WQC of 1991 Ripogenus Project License. The Licensee’s Appendix C filing fails to provide data comparable to historic 1981-1984 aquatic insect species composition and abundance.

Table 35 shown below and from the 1991 Application provides useful information on taxa collected in 1982. Ephemeroptera and Trichoptera (Mayflies and Caddis flies) dominated the Surber samples. These are the insect Orders that salmon and, to a lesser degree, brook trout depend on as a food source. Salmon and trout are the species of MeDIFW’s Ripogenus Project management goals that focus on growth, survival, and spawning escapement. EPT abundances determine if these goals are being met.

TABLE 35. BENTHIC MACROINVERTEBRATE DENSITY (INDIVIDUALS . $m^{-2}$) AND PERCENT COMPOSITION (%) COLLECTED WITH MID-CHANNEL SURBER SAMPLES, 25-27 JUNE 1982 IN THE WEST BRANCH OF THE PENOBSCOT RIVER, PISCATAQUIS COUNTY, MAINE.

| TAXA | BIG EDDY DENSITY* | % | BIG "A" FALLS DENSITY | % | HORSERACE DENSITY | % | NESOWADNEHUNK FALLS DENSITY | % | HEAD OF ABOL DEADWATER DENSITY | % | ABOL BRIDGE DENSITY | % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oligochaeta | 147.1 | 2.8 | 154.3 | 3.9 | 46.6 | 2.3 | 118.4 | 2.3 | 165.0 | 5.9 | 186.6 | 9.0 |
| Turbellaria | 520.3 | 9.8 | 434.1 | 11.1 | 305.0 | 14.9 | 1173.3 | 23.2 | 283.5 | 10.2 | 200.9 | 9.7 |
| Ephemeroptera | 1252.2 | 23.6 | 1435.2 | 36.7 | 656.6 | 32.1 | 828.8 | 16.4 | 599.2 | 21.5 | 505.9 | 24.5 |
| Odonata | 10.8 | 0.2 | 3.6 | 0.1 | 0.0 | 0.0 | 21.5 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| Coleoptera | 3.6 | 0.1 | 3.6 | 0.1 | 3.6 | 0.2 | 43.1 | 0.9 | 43.1 | 1.5 | 28.7 | 1.4 |
| Trichoptera | 2870.4 | 54.2 | 1385.0 | 35.4 | 710.4 | 34.7 | 2066.7 | 40.9 | 979.5 | 35.2 | 692.5 | 33.5 |
| Diptera | 229.6 | 4.3 | 283.5 | 7.2 | 276.3 | 13.5 | 588.4 | 11.6 | 624.3 | 22.4 | 373.2 | 18.1 |
| Plecoptera | 57.4 | 1.1 | 150.7 | 3.9 | 17.9 | 0.9 | 179.4 | 3.6 | 21.5 | 0.8 | 50.2 | 2.4 |
| Other | 204.5 | 3.9 | 61.0 | 1.6 | 28.7 | 1.4 | 32.3 | 0.6 | 68.2 | 2.4 | 28.7 | 1.4 |
| All | 5295.9 | 100.0 | 3910.9 | 100.0 | 2045.2 | 100.0 | 5051.9 | 100.0 | 2784.3 | 100.0 | 2066.7 | 100.0 |

*represents a mean of 3 replicate samples

For the reasons stated above, FERC should require that the Water Quality Study be corrected and expanded in the final study Report. Meaningful West Branch aquatic communities' data, comparable to data presented in the 1991 License Application should be collected and presented in tabular form. In addition, planktonic populations of the Ripogenus Impoundment should be described in a manner comparable to information presented in the 1991 Application.

Thank you for the opportunity to comment and suggest a path forward that will provide meaningful information for the agencies and stakeholders.

Ed Spear
307 Mt Hope Ave
Bangor, Me O4401
Email: edspear1@yahoo.com
Phone: 207-217-4288

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Kimberly D. Bose, August 14, 2023
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Dear Secretary Bose, Via Electronic filing
Subject: Ripogenus Project P-2572. Rebuttal of GREAT LAKES HYDRO AMERICA, LLC RESPONSES TO COMMENTS ON THE INITIAL STUDY REPORT AND REQUESTS FOR NEW OR AMENDED STUDIES RIPOGENUS HYDROELECTRIC PROJECT (FERC NO. 2572) PENOBSCOT MILLS HYDROELECTRIC PROJECT (FERC NO. 2458) GREAT LAKES HYDRO AMERICA, LLC, August 7, 2023

The following comments deal only with the Ripogenus Project. Comments dealing with the North Twin Project will be provided in separate filings.

The Licensee's August 7, 2023 legally crafted response to study comments and requests is an argument that misrepresents facts and information provided by the Maine Department of Inland Fisheries and Wildlife (MeDIFW). Furthermore, in citing various statutes the Licensee ignores the fact that the Maine Water Quality Certification (WQC) process includes narrative standards. The Licensee is desperately attempting to avoid any facts that would disprove claims made regarding the Ripogenus Project's current peaking operation and the concurrent impoundment drawdown. The Licensee has consistently rebuffed all attempts to collect quantitative angler use and catch (a designed use) as well as quantitative fish and aquatic communities' data. The Licensee's arguments are based on information and assumptions that are simply false.

The Licensee's discussion of a Creel Survey Study (4.1) is a classic example of the failure to understand fisheries management methods, and goals. In an attempt to circumvent the angler use and catch issue, the Licensee added "angler questions" to the Recreational Study. This will not meet the necessary WQC standard. The Licensee continues to call angler survey boxes "creel surveys." Simply put, the Licensee is attempting to revise history and turn subjective judgement into quantitative data.

Angler surveys are common fishery management tools and are used at various levels of intensity e.g., mail survey, angler boxes, aerial surveys, and on-site creel surveys with face-to-face contact occurring on a daily

schedule. In their June 30, 2023 letter MeDIFW discussed a much-needed creel survey and begged for funding.

*MDIFW plans to periodically collect CPUE data on the West Branch of the Penobscot in the future. Therefore, we must rely on a repeatable survey method. While it would be desirable to have the sufficient staff to conduct full clerk surveys (emphasis added) on this large, important river (and many other locations in the Region), it just is not feasible due to current staffing levels.*

Th Licensee does not seem to understand the difference between voluntary angler survey boxes and creel surveys. The former is passive and depends entirely on angler cooperation and is subject to prestige bias (only successful anglers respond) as well as (angler) fabrications. The latter is direct angler contact where even non cooperative anglers are counted. Angler survey boxes provide "trends"; the same biases are repeated from year to year. Angler creel surveys require the angler to respond to a number of questions e.g. time fished, legal fish caught, sub-legal fish caught, size information and riverine reach fished. Anglers need not find a pencil or flashlight to respond. Creel surveys are robust, and they collect a variety of fishery parameters. Any survey method that does not collect catch per unit effort, (e.g. enumerate anglers and their effort), catch, and river reach is not an appropriate method to judge a fishery in decline or to form the basis for a thirty-year license.

In a classic miss-use of data, the Licensee uses MeDIFW angler survey box information as a description of the current West Branch fishery.

Angler Census Boxes – West Branch Downstream of McKay Station (multiple locations) 2021
-Anglers reported catching 864 Landlocked Salmon and 182 Brook Trout; Landlocked Salmon ranged from 5 to 21 inches long; Brook Trout ranged from 5 to 8 inches long
Angler Census Boxes – West Branch Downstream of McKay Station (multiple locations) 2022
Anglers reported catching 748 Landlocked Salmon and 76 Brook Trout; Landlocked Salmon ranged from 5 to 24 inches long; Brook Trout ranged from 5 to 8 inches long

It should be noted that survey box fish lengths are estimates provided by anglers.

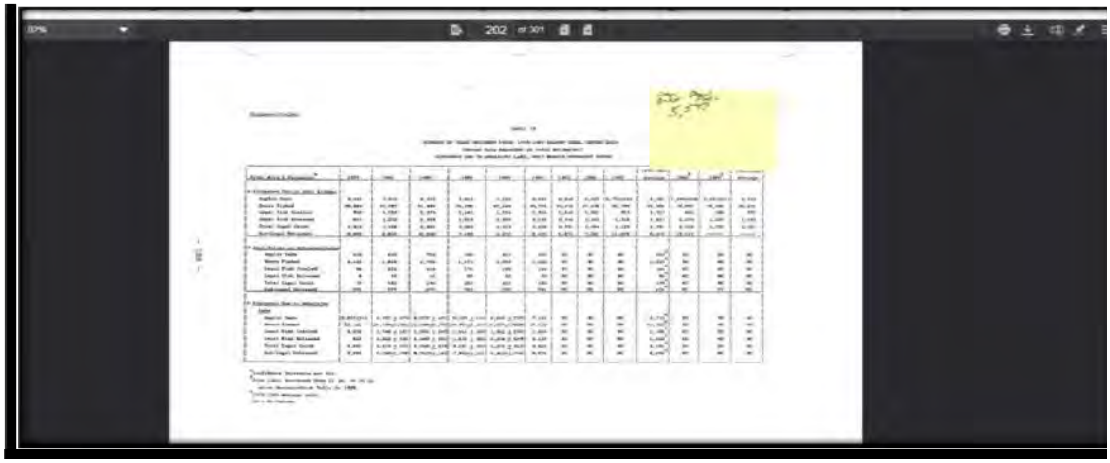
From these MeDIFW data, it is impossible to determine if angling success has improved, declined, or remained constant since 1991. If trends are considered, angler success appears to have declined in 2022 when compared to 2021.

Worldwide, nationwide or in Maine, anglers typically fish for bigger fish, i.e. legal size or trophy size. Fishery management goals commonly focus on

the abundance/availability of legal-size fish. As they are not the target of most anglers, the abundance of sub-legal fish, salmon in this case, is of minor importance. The inclusion of sub-legal salmon in the MeDIFW's data in an attempt by the Licensee to obfuscate angler success.

Table 39 shown below is taken from the Ripogenus Project 1991 Application and provides a robust estimate of West Branch angler use (angler days), effort (hours fished) and catch (legal and sub-legal salmon). Unfortunately, there are no current data available for comparison purposes.

Table 39. Creel Survey Data found in the 1991 Ripogenus Project License Application Vol IX, Landlocked salmon, Angler effort and Catch



From the above table, the average 1979-1987 use was an estimated 6,254 angler days, and the estimated catch was 2,954 legal size salmon (the length limit changed in 1986). An addition 8,245 sub-legal salmon were released. The best year in total catch was 1984 where 6,546 anglers caught 3,628 legal sized salmon and 8,450 sub legal salmon were released. The MeDIFW angler survey boxes that I observed along the river were in prime locations. MeDIFW site selection was reasonable but adds additional bias. Tabular angler use and catch material is presented by riverine reach in IX of the 1991 Application, but 2021-22 catch by survey **box locations are not presented by the Licensee, no direct comparison can be made.** Still when historic data are compared to the 2021-22 MeDIFW results, the West Branch Fishery has been seriously degraded by the change in Project operations.

MeDIFW is “comfortable” with their knowledge of the West Branch fishery. This is a term of art. Management (catch and size limits) of a fishery can be adjusted based on the reported survey box catch. This is appropriate for some trout ponds but not major fisheries. For the West Branch, “a large Important River” (MeDIFW), “comfortable” is not based on the salmon population size, survival, or age and growth data as none exist. MeDIFW is truly underfunded, and they clearly emphasized their desire to conduct a West Branch creel survey in their June 30, 20023 filing should funds become available. Despite MeDIFW’s comfort level, not to be confused with knowledge of population structure, age and growth and food habits, licensing standards are not being met. Existing West Branch salmon (and aquatic community) information fails to meet the level of detail required in issuing a 30 year license.

On July 7, 2023 a McKay station outage produced disastrous environmental impact on fish and aquatic communities, and anglers. Impacts of the outage flows e.g., loss of young-of-the-year salmon, may last three to five years. This outage event combined with the total lack of current quantitative data on West Branch angler use and catch information begs for on-site creel survey data.

The Licensee has proved their lack of ability in conducting West Branch surveys e.g. the failure to collect scale samples during the fish assemblage studies, selection of the McKay Station water quality study site, and mass confusion between the Little Ambejackmockamus and Big Ambejackmockamus Falls Water Quality sampling site. The Licensee is conflicted and should not be entrusted to conduct a creel survey, a survey that might further damage its legal positions. Clearly, this is a task that is best suited for MeDIFW. FERC should require that the Licensee fund an entry level (Moosehead Region) fishery position dedicated to the Ripogenus Project with the primary obligations to a West Branch creel survey (and smelt drift net collections).

For over two years the Licensee has told the agencies and stakeholder that nothing has changed and that all impoundments are riverine reaches exist as they did 35 years ago. This pipe dream is simply posturing. The Licensee has filed its pages of response with legal standards. New studies that would provide, in this case, fisheries information, have been fought at every opportunity. In the interim, the Ripogenus Project fish and aquatic communities suffer. The burden of proof lies with the Licensee.

For the reasons stated above, FERC should reject the Licensee's RESPONSES TO COMMENTS ON THE INITIAL STUDY REPORT dated August 7, 2023. FERC should reject the often repeated arguments that opposed robust West Branch creel surveys. There is a clear need to define recreational anger use (days fished), effort (hours fished) and catch (legal and sub-legal salmon and brook trout caught) and river reach fished.

Thank you for the opportunity to comment.

Ed Spear
307 Mt Hope Ave
Bangor, Me O4401
Email: edspear1@yahoo.com
Phone: 207-217-4288

Kimberly D. Bose, Secretary August 14, 2023
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

RE; Ripogenus Project, FERC No. 2572; Response to Allegations of Flow Deviations filed August 11, 2023

Great Lakes Hydro America's (Licensee) response to FERC's August 4th letter concerning the Jully 7th McKay Station outage and subsequent low flow violation. This filing of events during that outage flow provides some useful information but fails to deal with serious environmental issues. The Licensee doesn't provide evidence that outage flow of 400 cfs were met. The Licensee also failed to provide a detailed time line and methods that dealt with restoration of river flow. More importantly, FERC requested details of environmental impacts are ignored.

The referenced lighting strike outage of July 7 was ill-timed and an unfortunate event. The Licensee lost the ability to generate from two turbines and had to stunt water downstream to meet North Twin impoundment elevation requirements. The fish and aquatic communities were devastated. In short, both an energy production and environmental disaster. A lose-lose situation.

As noted in earlier filings, impact from this outage event could have been prevented/reduced had Ripogenus Dam gates been fitted with back-up emergency generators. A few dollars were needed to protect environmental resources. Environmental concerns were ignored.

The Licensee's August response to FERC contains the often-repeated license requirements but is short in critical details. Licensee maintains that West Branch River flow never dropped below 400 cfs. They say that while noting the station was both unmanned and off-line. Pictures of the river, dead fish, and angler/camper observation suggest this was not the case. As explained below, the licensee needs to provide critical July 7th information.

The Licensee has provided hourly average flows for the five-hour outage period and flows immediately before and after this event. While "hourly

averages" meet license reporting standards, low flows can be obscured by averaging. From my past experience, there is a transition period between McKay Station outage and start-up emergency flows. Additionally, the 610 cfs flow appeared to calculated from gate settings. This is concerning given that the station was unmanned and "off-line" during the first hours of the outage event. The requested chronology and manning of the License's july7th response was not provided. This information is cri. cal. How was the 13% Wicket Gate flow(s) confirmed? When I last entered the scroll case, there was much debris. There is always some variation in flows, if only from the Ripogenus log sluice gate setting of 100 cfs. How can an exact flow average of 610 cfs over a four hour period be possible?

From tabular flow information provided by the Licensee in their August 11th, outage report reply state flows remained at 610 cfs for five hours. No reason is provided for the five hour delay in opening a Ripogenus Dam deep gate. This inexcusable delay exasperated the impacts on fish and aquatic communities. The Licensee's October 2022 Outage Study demonstrated severe impacts to fish and aquatic communities. The July 7th outage was even more diasterous, recently emerged Landlocked salmon (salmon) fry (alevin) are extremely vulnerable to dewatering and the rapid rise of river flow.

The licensee failed to respond to or even note, the apparent violation of Article 406, the Holbrook Bypass Channel spawning and nursey area. Low flows for the duration of the five hours reported by the Licensee, dewatered this critical salmon nursey area. While FERC may conclude that this event was not a license violation, the fact remains that a year class of recently emerged landlock salmon was lost. The impact of the July 7 flow on newly emerged salmon occurred in all river reaches. The loss of a salmon age class impact could last for three to five years.

The FERC letter inquired about environmental impacts "*Please describe the methods used to check for environmental effects, including the areas surveyed*". The Licensee failed to respond to this reasonable request. To date, the reported incident of fish kills is from boaters and anglers. The impacts of a 5:59 PM outage would be delayed, evidence of fish kills would generally appear later in the evening. Ripogenus Dam gate flows that were increases at 11PM would normally wash downstream fish and insect caraccas and obscure much of the dewatering impacts. It is clear the July 7th outage produced fish and aquatic insect kills. FERC should err on the side of the resource when considering adjudicating damages.

As has been the case in these (re) Licensing proceeding the Licensee answers and provides data that suits its needs. FERC asked for additional data, information concerning environmental damage. Rather than admit that they were not on-site, and have no information to report, the licensee ignores the request. Environmental damage resulting from the July 7th "lighting strike" (somewhere in the Grid) is evident, I encourage FERC to purse requested information.

Thank you for the opportunity to comment. Please continue to purse this matter in an aggressive manner.

Ed Spear

GLHA oFloutage response (note lost generation)

Narrative

Outage response (min flow) can't be instantanous

Chronology ….time techican arrived

Email to V paul Reynolds

Hourly average

GLHA search for environmental impacts, dead fish

Gate setting: now and and in the past

- . other locations in the Region), it just is not feasible due to current sta#ng levels.
  Th Licensee does not seem to understand the difference between voluntary angler survey boxes and creel surveys. The former is passive and depends entirely on angler cooperation and is subject to prestige bias (only successful anglers respond) as well as (angler) fabrications. The latter is direct angler contact where even non cooperative anglers are counted. Angler survey boxes provide "trends"; the same biases are repeated from



Kimberly D. Bose August 17, 2023
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426 Via Electronic Filing

RE; Ripogenus Project, FERC No. 2458-136; Great Lakes Hydro America's Response to Requested Studies: **4.3 North Twin Tributary Access Study using Radio Telemetry**

**Dear Secretary Bose,**

**One of the Maine Department of Inland Fisheries and Wildlife's (MeDIFW) initial study requests was for the study of North Twin Impoundment landlocked salmon (salmon) pre-spawning behavior through the use of radio tags. The questions were: movement of North Twin Impoundment salmon, locations of spawning tributaries, the impact of water level management on salmon passage into tributary streams, and possible shoreline spawning. Only one phase of this study was approved. The Licensee has repeatedly sought to prevent collection of meaningful salmon spawning behavior though the use of radio telemetry.**

**In a July 4, 2023 filing, I commented on the Licensee's refusal to conduct this reasonable radio tagging study. Other than the Licensee seems focused on salmon shore spawning, little has changed.**

**As presented, the Licensee's proposal is a salmon spawning study without salmon!!! It is guesswork to determine where (and when) salmon that created redds originated. Redds in Nahmakanta stream could be from Nahmakanta or Jo-Mary Lakes, the West Branch, or from the North Twin Impoundment salmon (or even brook trout). Direct or indirect (data loggers') observations of radio tagged salmon spawning or about to spawn in tributary locations will confirm "access" questions.**

**Consistent with the Licensee's denial of other requested studies, interpretations of legal statutes are used rather than science-based**

**facts. The 1991 License Application provides search results from possible tributary spawning locations as well as potential barriers resulting from impoundment fluctuations. Boulders, ledges, and rocks in tributary streams remain as they were during earlier studies. The Licensee was aware of the results of the "access" component of MeDIFW's request and knew there were no physical barriers. However, the Licensee accepted MeDIFW's Tributary Study request with major modifications. Realistically, as the study is now presented, the Licensee should simply reference the 1991 Application, as no new information will be provided. Without telemetry, salmon shore spawning will be inconclusive.**

**The key to the MeDIFW tributary access request was more about behavior rather than the salmon's ability to access certain spawning areas and possible shore spawning. These two questions require radio telemetry. A salmon response to lake level management under a variety of scenarios could alter traditional spawning staging locations. Such areas might be too shallow or alternately too deep. Predation could be increased; fish could wander off. Shore spawning is much less likely. As noted by Boucher 2012, . Maine Landlocked Salmon: Life History, Ecology, and Managemen**t, "Salmon prefer lake outlets or large inlets for spawning, but where these are lacking, they may utilize lake shoals or small inlets, though production from these areas is generally very low". The Licensee failed to provided peer reviewed information: physical, thermal, or chemical data that describe possible shore spawning search criteria. The Licensee's suggestion that possible shore spawning areas can be visibly identified is both labor intensive and absurd.

The Licensee argues that "Pursuant to the July 26, 2012 Order Amending Ar. cle 408, from August 22 to October 15,"(PAD 4-48), "the fall drawdown has generally been limited to 2-3 feet in magnitude, limiting the potential impact to spawning areas". This is yet another attempt to obfuscate the issue. Salmon spawn in November and spawn in stream habitats not subject to impoundment elevation. Additionally, the legislature's charter flow requirement of 2000 cfs "by Millinocket" appears to supersede drawdown restrictions.

With the exception of the historic West Branch Channel where the Licensee attempted to change fisheries management goals to Brook trout, the Licensee has fought all studies that would provide information on current operations. The thought of radio tagged salmon swimming around the

North Twin impoundment terrorizes the Licensee as it may limit its free hand to sell the public water for its generation value. So be it. Radio tagging of North Twin impoundment salmon source fish will identify spawning staging areas, and any behavioral changes brought on by water level management and the presence or absence of shore spawning. Should (tagged) North Twin salmon move into the West Branch, then McKay Station spawning flows could be considered an additional Ripogenus Project enhancement.

Additionally in the early 2000s, the licensee (Normandeau Associates) used radio tagged salmon and Brook trout to study movement when Licensing the Moose River of the Brassua Project (P 2615). The North Twin Impoundment study goals are similar Moose River Salmon movement and spawning questions.

Should FERC staff decide that radio telemetry is not needed, the study is meaningless as it provides no new information. If this is the case, I urge MeDIFW to withdraw its study request. As presented the Licensee's proposed tributary study is a sham. Any study that produces no new information is a waste of time and resources resolving the issues. I urge FERC to respond accordingly.

Thank you for the opportunity to respond.

Ed Spear
307 Mt Hope Ave.
Bangor, Me 04401
Email: edspear1@yahoo,com
Phone: 207-217-4288

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JANET T. MILLS
GOVERNOR

STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
353 WATER STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041

JUDITH CAMUSO
COMMISSIONER

***Via Electronic Filing***

August 25, 2023

Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

**Re: MDIFW Clarification on GLHA Response to Comments on the Initial Study Report and Requests for New or Amended Studies for the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458)**

Dear Secretary Bose:

On August 7, 2023, Great Lakes Hydro America, LLC (GLHA), a subsidiary of Brookfield Renewable, submitted their Response to Comments on the Initial Study Report and Requests for New or Amended Studies for the Ripogenus Hydroelectric Project (FERC No. 2572-133) and Penobscot Mills Hydroelectric Project (FERC No. 2458-247).

The Maine Department of Inland Fisheries and Wildlife (MDIFW) appreciates that GLHA has adopted our Umbazooksus Lake Mitigation Evaluation Study Plan. However, it was "Adopted as Requested or with Modification" for the following reason:

> *"GLHA notes that the current mitigation measure implemented at Umbazooksus Lake consisted of permanently opening the discharge gate to lower the lake level and increase the wetland habitat at Umbazooksus Lake. If the water surface elevation of Umbazooksus Lake was raised, it would decrease the wetland habitat. Therefore, GLHA did not adopt MDIFW's request to evaluate the change in habitat resulting from a potential increase in water surface elevation at Umbazooksus Lake."*

GLHA did not provide information to support the claim that by adding water on this impoundment it would decrease the total acres of wetlands, and MDIFW does not agree with this statement. Our limited analysis of aerial imagery indicates that by adding water on the impoundment there would be an increase in the level of *interspersion* in these areas at a minimum, if not *increase* the total acres of wetlands. We believe that by increasing the interspersion of these fringe wetlands through higher lake levels, wetland function will improve in these areas and, over time, increase the acres of emergent and aquatic bed. These are important wetland types that are found in higher quality wetlands and would support a diversity of wildlife including waterfowl, wading birds, and aquatic furbearers. In addition, they are the wetland types that seem to be noticeably absent, or are of very low quality, in larger hydroelectric impoundments in projects managed similar to the Ripogenus Project.

Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,



John Perry
Environmental Review Coordinator

Cc: Doug Kane, Scott McLellan—MDIFW Wildlife Division, Region E
Mark Caron, Lauren McPherson—MDIFW Wildlife Division, Region F
Casey Clark, MDMR
Kyle Olcott, Laura Paye—MDEP
Julianne Rosset, USFWS

Brookfield
Renewable U.S.

August 30, 2023

***Via eFiling***

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Response to MDIFW Comments on Requested Umbazooksus Lake Mitigation Evaluation Study Plan**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), the Licensee of the Ripogenus Hydroelectric Project (No. 2572) and the Penobscot Mills Hydroelectric Project (No. 2458) (collectively referred to as the "Projects"), herein files with the Federal Energy Regulatory Commission (FERC) responses to comments filed by the Maine Department of Inland Fisheries and Wildlife (MDIFW) on August 25, 2023 related to the Umbazooksus Lake Mitigation Evaluation Study Plan. The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot counties, Maine.

In their August 25, 2023 letter, MDIFW indicated that GLHA did not provide information to support the claim that adding water to Umbazooksus Lake would decrease the total acres of wetlands. As such, GLHA reviewed the Wetland Enhancement Plan (filed with FERC on October 21, 1997) and the Umbazooksus Lake Wetlands Enhancement Final Report (filed with FERC on May 31, 2005) pursuant to Article 408 and 410 of the licenses for the Ripogenus and Penobscot Mills Projects, respectively.

As indicated in the 1997 Plan, "The objective of wetland enhancement at Umbazooksus Lake will be to substantially increase the extent, density, and species diversity of wetland vegetation cover within the zone from the former full pond elevation down to approximately six feet below ordinary low water. This will be achieved by lowering the average water level of the impoundment, establishing a more consistent hydrologic regime from year-to-year, and reducing the variability of water levels during the growing season of any given year. These changes are expected to enhance the ability of the existing wetlands to perform wetland functions such as wildlife habitat, production export, water quality enhancement, and shoreline protection, and are also expected to lead to the establishment of emergent and aquatic bed wetlands in previously unvegetated areas." Also as indicated in the 1997 Plan, the wetlands that existed at Umbazooksus Lake under the prior water management and higher water levels were limited to fringe emergent and shrub wetland types around the shore of the impoundment. Due to the lake's bathymetry, including a lake bottom that is largely flat or gently sloping, a lowered water level was agreed upon through agency consultation to enhance the fringe wetland types that existed at the time and to establish new emergent and aquatic bed wetlands within the lake.

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

As indicated in the 2004 Final Report, "The 320 acres of wetlands that had been degraded by the former operational regime are now well on their way to recovery. Vegetation cover (density) has increased in all vegetation zones, including a substantial increase in the E/F zone since 1998. Overall, vegetation cover (i.e., density) has increased over 350 percent. The conversion of many areas from E to SS/E cover, and the overall increase in the species richness and density of trees and shrubs, indicate that plant community succession is occurring in the areas formerly affected by flooding, and an inward/downward shift of cover type zones is underway. In addition, the total extent of vegetated wetlands surrounding Umbazooksus Lake has so far increased by approximately 117 acres since 1998. This is the result of emergent and floating-leaved vegetation expanding into newly available shallows created by maintaining the gate in a permanently open position." The final report, which was based on wetlands monitoring from 1998-2004, demonstrated the considerable increase in shallow areas in Umbazooksus Lake (less than 6 feet deep, and estimated to be 280 acres) that resulted by lowering the water level and which were expected to eventually support wetland vegetation. FERC approved this final report on December 20, 3005.

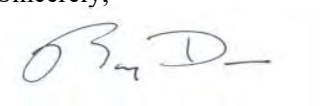
GLHA believes MDIFW's request to evaluate higher water levels at Umbazooksus Lake are in conflict with the original intent and design of this mitigation measure that was determined through extensive consultation with resource agencies and subsequent monitoring that verified the intended results.

Alternatively, GLHA is proposing a study to collect contemporary data at Umbazooksus Lake to evaluate the current conditions in relation to the intended mitigation measure and the current relicensing of the Projects.

Concurrent with this filing, GLHA is providing a copy of this letter to all parties listed in the attached distribution list. Parties can download an electronic copy of this filing from FERC's eLibrary system at https://www.ferc.gov/ferc-online/elibrary by conducting a search using the docket numbers P-2458 and/or P-2572.

If you have any questions regarding this filing, please contact me by phone at (207) 775-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman, Licensing Manager
Brookfield Renewable

cc: Relicensing Distribution List

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

**Federal Agencies**

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Stephanie Carman
Acting District Manager
Northeastern States
Bureau of Land Management
626 E. Wisconsin Avenue, Suite 200
Milwaukee, WI 53202-4617

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Kimberly Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Karen McGuire
New England Region 1
Deputy Regional Administrator
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

**State Agencies**

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Kyle Olcott
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Peter Jamieson
Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
40 Western Avenue
E.S. Muskie Federal Building, Room 412
Augusta, ME 04330

Stacey Guerin
State Senator
3 State House Station
Augusta, ME 04333

Kathy Irene Javner
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, Maine 04333

Trey Stewart
State Senator
3 State House Station
Augusta, ME 04333

James Lee White
State Represenative
House Minority Office
Room 332, State House
2 State House Station
Augusta, ME 04333-0002

**Native American Tribes**

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Rena Newell
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

**Additional Parties**

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground
ssindo@chewonki.org

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund
sperry@maine.com

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Kelly Maloney
Manager
Great Lakes Hydro America LLC
150 Main Street
Lewiston, ME 04240

Jesika Lucarelli
Great Mountain Guide Service
greatmountaings@gmail.com

Mark Nadeau
International Association of Machinists
245 Pamola Park
Millinocket, ME 04462

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Director
Maine Professional River Outfitters
PO Box 669
Millinocket, ME 04462-0669

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing
mary@mxhmarketing.com

Matt Polstein
New England Outdoor Center
matt.polstein@gmail.com

Michael Smith
Outdoor Sport Institute
176 Highland Ave
Millinocket, ME 04462

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Allison Economy
Representative for Allagash Gateway
Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Thomas Nannery
Sportsman's Alliance of Maine
205 Church Hill Rd
Augusta, ME 04330-9801

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Jeffrey Reardon
Maine Brook Trout Project Director
Trout Unlimited
267 Scribner Hill Road
Manchester, ME 04351

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,
sharon.klein@maine.edu

Dean Beaupain
dean@bloomerrussell.com

Jeff Fayle
jfayle@gmail.com

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti
granby@cox.net

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris
nsharris@mgh.harvard.edu

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Christopher Howe
funpow89@yahoo.com

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, DC 20426
September 19, 2023

OFFICE OF ENERGY PROJECTS

Project Nos. 2572-133 & 2458-247 –
Maine
Ripogenus Hydroelectric Project
Penobscot Mills Hydroelectric Project
Great Lakes Hydro America, LLC

VIA FERC SERVICE

Mr. Randy Dorman, Relicensing Manager
Brookfield Renewable
150 Main Street
Lewiston, Maine 04240

**Subject: Determination on Requests for Study Modifications and New Studies for the Ripogenus and Penobscot Mills Hydroelectric Projects**

Dear Mr. Dorman:

Pursuant to 18 C.F.R. § 5.15 of the Commission's regulations, this letter contains the determination on requests for modifications to the approved study plan and new studies for the proposed relicensing of Great Lakes Hydro America, LLC's (GLHA) Ripogenus and Penobscot Mills Hydroelectric Projects (collectively, the "Projects"). The Projects are located on the West Branch of the Penobscot River and on Millinocket Stream in Piscataquis and Penobscot Counties, Maine. The determination is based on the study criteria set forth in sections 5.9(b), 5.15(d), and 5.15(e) of the Commission's regulations, applicable law, Commission policy and practice, and Commission staff's review of the record of information.

Background

The study plan determination (SPD) for the project was issued on May 13, 2022, and required GLHA to conduct 24 studies, including a *Water Quality Study* comprising five components, and file an initial study report (ISR) on those studies by May 13, 2023.

GLHA filed the ISR on April 24, 2023,[1] and held study report meetings on May 2-4, 2023, to present the ISR results, and filed a summary of the meeting on May 22, 2023.

Comments

Comments on the ISR and meeting summary, including requests for new studies, were filed by: the National Marine Fisheries Service on July 10, 2023; the Maine Department of Inland Fisheries and Wildlife (Maine DIFW) on June 29, 2023; the Maine Department of Marine Resources on July 6, 2023; the Maine Bureau of Parks and Lands on July 6, 2023; the Maine Council of Trout Unlimited (Maine TU) on July 5, 2023; American Whitewater and Appalachian Mountain Club on July 6, 2023; Maine Professional Rafting Outfitters on July 6, 2023; the Caribou and Chesuncook Lake Camp Association, Chesuncook Village Association, and the Chesuncook Dam Camp Association on June 20, 2023; Christopher Howe on July 6, 2023; Jeff Kaine on June 8, 2023; and Edward Spear on June 5, 2023, June 30, 2023, July 5, 2023, July 6, 2023, and July 7, 2023. GLHA filed reply comments on August 7, 2023. On August 15, 2023, and August 18, 2023, Edward Spear filed responses to GLHA's August 7, 2023 filing. On August 25, 2023, Maine DIFW filed a response to GLHA's August 7 filing.

A number of the comments do not specifically request modifications to the approved studies or additional studies, and, therefore, are not addressed herein. For example, some of the comments provide additional information; recommend protection, mitigation, and enhancement measures; address potential effects on environmental resources; address ongoing and future consultation; express disagreement with the results of the studies, or how the data and results were presented; or request additional information that is contingent upon the results of incomplete studies. GLHA has subsequently provided some of the requested information in its reply comments and some will be provided in future filings. This determination only addresses new comments or requests to modify the study plan. This determination does not address requests for modifications to studies that were previously requested, but not required by the study plan determination (e.g., Maine DIFW's, Maine TU's, and Edward Spear's requests for an Atlantic salmon radio-tagging study).

Study Plan Determination

Pursuant to section 5.15(d) of the Commission's regulations, any proposal to modify a required study must be accompanied by a showing of good cause, and must include a demonstration that: (1) the approved study was not conducted as provided for in the approved study plan; or (2) the study was conducted under anomalous

[1] On February 17, 2023, Commission staff approved GLHA's request to modify the schedule for filing the ISR by moving the date up from May 13, 2023 to April 22, 2023. Because April 22 fell on a Saturday, GLHA timely filed the ISR on the next business day, which was April 24, 2023.

environmental conditions or that environmental conditions have changed in a material way. As specified in section 5.15(e), requests for new information gathering or studies must include a statement explaining: (1) any material change in law or regulations applicable to the information request; (2) why the goals and objectives of the approved study could not be met with the approved study methodology; (3) why the request was not made earlier; (4) significant changes in the project proposal or that significant new information material to the study objectives has become available; and (5) why the new study request satisfies the study criteria in section 5.9(b).

Appendix A summarizes the determination on the requested modifications to the approved study plan for 10 studies. Specific modifications to the studies and the basis for modifying them are explained in Appendix B. Appendix C provides the determination on the requests for eight new studies. Commission staff considered all study plan criteria in accordance with sections 5.9(b) and 5.15(d) and (e) of the Commission's regulations.[2] However, only the specific study criteria relevant to the determination are referenced in Appendices B and C.

Please note that nothing in this determination is intended, in any way, to limit any agency's proper exercise of its independent statutory authority to require additional studies. If you have any questions, please contact Allan Creamer at (202) 502-8365, or via email at allan.creamer@ferc.gov.

Sincerely,

JOHN WOOD

Digitally signed by JOHN WOOD
Date: 2023.09.19 12:59:28 -04'00'

for
Terry L. Turpin
Director
Office of Energy Projects

[2] Additional time was needed to review and respond to filings that, among other things, requested eight new studies; therefore, pursuant to section 5.29(f)(2) of the Commission's regulations, section 5.15(c)(6) is waived to provide the additional time needed to address the required modifications to the approved study plan.

Enclosures: Appendix A – Summary of Determinations on Proposals and Requests to Modify Study Plan

Appendix B – Staff Recommendation on Requested Study Modifications

Appendix C – Staff Recommendations on Requested New Studies

Appendix D – Literature Cited

## APPENDIX A

## SUMMARY OF DETERMINATION ON PROPOSALS AND REQUESTS TO MODIFY STUDY PLAN

**Requested Study Modifications (*see* Appendix B for Discussion)**

| Study | Recommending Entity | Approved | Approved with Modifications | Not Approved |
|---|---|---|---|---|
| 4. Water Quality Study | Edward Spear | | | X |
| 5. Fish Assemblage Study | Maine TU,[3] Edward Spear | | X | |
| 6. Instream Flow and Habitat Assessment of West Branch Downstream from Stone Dam Study | Maine TU, Edward Spear | | | X |
| 7. North Twin Impoundment Tributary Access Survey | GLHA, Maine DIFW,[4] Maine TU, Edward Spear | X [5] | | X [6] |
| 8. Upstream American Eel Passage Assessment | GLHA, Maine TU | X | | |
| 15. Common Loon Management Plan Assessment | Edward Spear | | | X |

[3] Maine Council of Trout Unlimited.

[4] Maine Department of Inland Fisheries & Wildlife

[5] GLHA's proposed modifications to the *North Twin Impoundment Tributary Access Survey*.

[6] Maine DIFW's, Maine TU's, and Mr. Spear's proposed modifications to the *North Twin Impoundment Tributary Access Survey*.

| Study | Recommending Entity | Approved | Approved with Modifications | Not Approved |
|---|---|---|---|---|
| 16. Recreation Study | Maine BPL,[7] Camp Associations,[8] AW/AMC,[9] Christopher Howe, Maine PRO,[10] Maine TU, | | X | |
| 17. Whitewater Boating Assessment | Maine BPL, AW/AMC, Maine TU, Christopher Howe | | X | |
| 18. Aesthetics Study | Maine BPL, AW/AMC | X | | |
| 20. Environmental Justice Study | Maine TU, AW/AMC | X | | |

[7] Maine Bureau of Parks and Lands.

[8] Caribou and Chesuncook Lake Camp Association, Chesuncook Village Association, and the Chesuncook Dam Camp Association.

[9] American Whitewater and Appalachian Mountain Club.

[10] Maine Professional Rafting Outfitters.

**Requested New Studies (*see* Appendix C for Discussion)**

| Study | Recommending Entity | Approved | Approved with Modifications | Not Approved |
|---|---|---|---|---|
| McKay Station Fish Stranding Mitigation Study and McKay Station Ramping Rate Study | FERC Staff, Maine TU | X [11] | X [12] | |
| Smelt Study | Edward Spear | | | X |
| Creel Survey | Maine TU, Edward Spear | | | X |
| USGS Gage Feasibility Study | Maine DIFW | X | | |
| Penobscot Mills Bypass Channel Fishability/ Wadability Study | Maine DIFW, FERC Staff, Edward Spear | | X | |
| Umbazooksus Lake Mitigation Evaluation | Maine DIFW | X | | |
| Winter Recreation Access Study | Maine DIFW | | | X |

[11] FERC staff's recommended *McKay Station Fish Stranding Mitigation Study*.

[12] Maine TU's recommended *McKay Station Ramping Rate Study*.

## APPENDIX B

## STAFF RECOMMENDATIONS ON REQUESTED STUDY MODIFICATIONS

### 4. Water Quality Study

Background

The May 13, 2022, Study Plan Determination (SPD) required GLHA to conduct a *Water Quality Study* for the Ripogenus and Penobscot Mills Projects. The goals of the study were to: (1) collect current water quality data at the projects; (2) determine the composition of the projects' benthic macroinvertebrate[13] community; (3) determine the composition of the Ripogenus Project's fisheries community; and (4) collect aquatic habitat data at the projects. The specific objectives were to:

- determine the trophic state of the Ripogenus impoundment and the Penobscot Mills Project's five impoundments;[14];
- evaluate whether water temperature, dissolved oxygen (DO), and other water quality parameters (e.g., total phosphorus, chlorophyll-a) are meeting Maine water quality standards in: (1) the Ripogenus impoundment, the Upper Gorge (Ripogenus Dam to McKay Station), and McKay Station tailrace to 1,000 feet downstream; and (2) the Penobscot Mills Project area, including the impoundments, the project tailraces, the West Branch downstream from Stone Dam, and Millinocket Stream downstream from Millinocket Lake Storage Dam;
- demonstrate that the structure and function of the aquatic community within the Ripogenus impoundment, as determined from the composition of the benthic macroinvertebrate and indigenous fish communities, are maintained;
- determine whether 75 percent of the littoral zone of the North Twin impoundment and Millinocket Lake Storage impoundment remain watered during normal operations;
- demonstrate that existing minimum flows downstream from Stone Dam and Millinocket Lake Dam achieve applicable aquatic life standards;
- determine the composition of the benthic macroinvertebrate community within the

[13] Macroinvertebrates are animals lacking a backbone that are large enough to see without the aid of a microscope. They may be aquatic or terrestrial; the aquatic organisms often being larval or nymph forms of terrestrial species. Aquatic macroinvertebrates include annelids (segmented worms), mollusks (e.g., freshwater mussels), arthropods/crustaceans (e.g., crayfish), dragonflies and damselflies, stoneflies, mayflies, caddisflies, true bugs, beetles, true flies, and others.

[14] Millinocket Lake Storage, North Twin, Millinocket (Quakish Lake and Ferguson Pond), Dolby Pond, and East Millinocket impoundments.

Upper Gorge and the West Branch within 1,000 feet downstream from McKay Station, within the tailrace of each Penobscot Mills Developments, downstream from Stone Dam, and downstream from Millinocket Lake Storage Dam, and evaluate whether aquatic life criteria are attained; and

- determine if existing baseline minimum flow conditions in the Upper Gorge and in the West Branch immediately downstream from McKay Station provide aquatic habitat that meets the Maine Department of Environmental Protection (Maine DEP) hydropower guidance for riverine habitats.

The study area for the Ripogenus Project included the Ripogenus impoundment (and associated sub-basins), the Upper Gorge, and the McKay Station tailrace and river extending about 1,000 feet downstream. The study area for the Penobscot Mills Project included the North Twin impoundment and tailrace; the Millinocket impoundment and tailrace, as well as the West Branch downstream from Stone Dam; the Dolby impoundment and tailrace; the East Millinocket impoundment and tailrace; and the Millinocket Lake Storage impoundment and Millinocket Stream (to about 1,000 feet downstream from Millinocket Lake Storage Dam).

GLHA conducted the *Water Quality Study* in accordance with the SPD.[15] However, in the *Water Quality Study Report*, GLHA states that the macroinvertebrate sampling in the West Branch downstream from Stone Dam in 2022 did not yield sufficient data (numbers of macroinvertebrates) to document compliance with Maine's water quality standards.

Proposed Study Modifications

In response to comments received at the Initial Study Report (ISR) Meeting from the Maine Department of Inland Fisheries and Wildlife (Maine DIFW), GLHA, in 2023, installed water temperature loggers at three locations on the West Branch (about 0.1, 1.1, and 2.5 river miles) downstream from Stone Dam. The purpose of this monitoring is to determine the seasonality of ambient water temperatures adequate to support a managed fishery for cold water salmonids in the reach. Data were collected on an hourly basis during the monitoring period (June 8 to July 27) at the three locations. The results of the water temperature monitoring are to be provided in the Updated Study Report (USR).

As noted above, macroinvertebrate sampling in the West Branch downstream from Stone Dam did not collect enough macroinvertebrates for Maine DEP to run its macroinvertebrate model. Thus, GLHA is repeating the macroinvertebrate sampling in

[15] The details of the methodology used for the individual components of the study are provided in section 4.0 of the *Water Quality Study Report* [Appendix C of the Initial Study Report filed April 24, 2023].

the West Branch downstream from Stone Dam in 2023, per the methods in the approved *Water Quality Study*.[16]

Requested Study Modifications

In his comments on the *Water Quality Study*,[17] Edward Spear suggests that the information obtained from the study will not be sufficient to document compliance with Maine DEP's water quality standards. Mr. Spear asserts that the lack of information describing the Ripogenus impoundment plankton communities remains a data gap. Mr. Spear cites the following deficiencies in the study: (1) rather than describe current conditions, sampling areas and methods were chosen that do not allow for a comparison with data presented in the 1991 Great Northern Paper license application; (2) reaches selected for sampling do not represent the riffle, run, and pool areas of the West Branch; and (3) the *Water Quality Study* does not provide information to answer questions regarding changes resulting from a shift in project operation from the historical store-and-release mode to one of a peaking mode. To correct the alleged deficiencies, Mr. Spear requests that the *Water Quality Study* be modified to collect West Branch aquatic community data and sample plankton communities in the Ripogenus impoundment, presumably for the purpose of obtaining data comparable to that included in the 1991 license application.

In its comments, the Maine Council of Trout Unlimited (Maine TU) states that the study's objective to collect information sufficient to document compliance with Maine DEP's standards for aquatic life was not met,[18] and asserts that fresh data is needed to confirm the presence of native fish. In their comments, American Whitewater and Appalachian Mountain Club (AW/AMC) state that the study failed to: (1) achieve the study goal to determine if existing baseline minimum flow conditions in the Upper Gorge provide aquatic habitat that meets Maine DEP's hydropower guidance; and (2) show that the existing minimum flow provides sufficient wetted width in Millinocket Stream. However, neither entity provided details regarding modifications to the study plan.

Comments on Requested Study Modifications

In its reply comments, GLHA asserts that the *Water Quality Study* generally demonstrates that project waters meet Maine DEP's applicable water quality standards.

[16] GLHA conducted standard macroinvertebrate sampling in all project tailwater areas and reaches downstream from the project dams. All sampling was conducted using the same standard "bug-basket" methodology in accordance with Maine DEP protocols.

[17] *See* Edward Spear's August 10, 2023, Filing.

[18] Maine TU specifically identifies the following reaches: Upper Gorge, West Branch downstream from Stone Dam, and Ripogenus impoundment).

Regarding the Upper Gorge and Millinocket Stream, GLHA asserts that the studies completed in 2022 and other information in the ISR, achieved the study goal to determine if existing baseline minimum flow conditions [e.g., leakage from Ripogenus Dam (12 cubic feet per second (cfs)), as well as 100 cfs and 60 cfs from releases in the Upper Gorge and Millinocket Stream, respectively] provide aquatic habitat that meets applicable standards. For the West Branch downstream from Stone Dam, GLHA states that there is no evidence that the reach is "stagnant," nor are pools "disconnected" at any flow. Because aspects of the *Water Quality Study* are incomplete for the reach downstream from Stone Dam (e.g., macro-invertebrate sampling and flow modeling), GLHA states that it is premature to review conditions in the reach. Finally, GLHA commented on the attainment status of the Ripogenus impoundment only as it concerns the request for a *Smelt Study* in the impoundment (*see* discussion in Appendix C).

Discussion and Recommendation

The approved *Water Quality Study* is a comprehensive study designed to collect information on the impoundment's trophic state and aquatic habitat, riverine water quality and aquatic habitat, and benthic macroinvertebrate community. The study followed Maine DEP guidelines for collecting information needed to assess water quality relative to standards established by the state (e.g., wetted width standard) [section 5.9(b)6)]. In the Upper Gorge, transects were placed primarily in riffle/shallow run areas, which are more responsive to changes in flow than deep pools or deep runs. Transect locations were selected to represent limiting conditions at low flow for fish that may volitionally move in and out of the reach; thus, addressing zone-of-passage conditions. Transect habitat data[19] (collected in wadable areas of the reach) and drone footage show that adequate water depth and zone-of-passage conditions exist for resident fish species that inhabit the reach. For Millinocket Stream, data collected in 2022 show that the 60-cfs minimum flow provides adequate water depths and zone-of-passage conditions for resident fish inhabiting the reach.[20] Finally, there were 13 transects located within the two study reaches on the West Branch downstream from Stone Dam.

[19] Average water depth across the three transects at the leakage flow ranged from 0.7 to 1.4 feet (8.4 to 16.8 inches), and maximum depths ranged from 2.5 to 3.6 feet. Moreover, the Hilsenhoff Biotic Index value calculated for the macroinvertebrate community in the Upper Gorge was 3.46, which supports a finding of "Excellent" water quality and degree of organic pollution (Hilsenhoff, 1987).

[20] The existing 60-cfs minimum flow provides 90% to 91% of the streams wetted width, compared to bank-full conditions. Based on the cross-sectional plots of the stream bed and banks, the 60-cfs minimum flow provides a maximum depth of 1.6 feet (19 inches) and average depths of 0.6 feet and 0.7 feet (7.2 inches to 8.4 inches) at the two study transects. The Hilsenhoff Biotic Index value was 4.59, supporting a finding of "Good" water quality and degree of organic pollution (Hilsenhoff, 1987).

Overall, the portion of the study completed by GLHA in 2022 met the study goal of assessing the extent to which existing baseline minimum flow conditions provide adequate aquatic habitat relative to applicable standards [section 5.9(b)(1)]. Moreover, the study was conducted as required by the SPD, and the study was not conducted under anomalous environmental conditions, nor have the environmental conditions changed in a material way [section 5.15(d)(2).

Regarding Mr. Spear's request for a Ripogenus impoundment plankton study, this was not a goal of the approved *Water Quality Study*, nor was collecting comparable information to the data collected for the 1991 license application part of the approved study [section 5.9(b)(1)]. As to the plankton study, we stated in the SPD that there was no reason to suspect that any adverse effects on zooplankton[21] are specifically and directly related to lake level management in the Ripogenus impoundment. The studies completed in 2022 do not provide any information to establish such a connection [section 5.15(c)(4)]. Moreover, the limited information obtained from one season of zooplankton sampling would not be sufficient to answer the questions posed by Mr. Spear [section 5.9(b)(5)]. For these reasons, we do not recommend Mr. Spear's recommended modifications to the *Water Quality Study*.

With respect to Maine TU's request for additional information to confirm the presence of native fish, we address this request below, finding it unnecessary, as part of our discussion of the *Fish Assemblage Study*.

Finally, the approved macroinvertebrate data collection efforts were not completed in the West Branch downstream from Stone Dam in 2022. Moreover, the adequacy of the reach (i.e., seasonal water temperature) to support a seasonal salmonid fishery is a question that still needs to be addressed. GLHA's proposals to complete the required macroinvertebrate sampling downstream from Stone Dam and to collect water temperature data in the reach would provide important data to inform development of license requirements [section 5.9(b)(6)], and the additional temperature monitoring would not add significantly to the cost of the study [section 5.9(b)(7). Therefore, we recommend the required macroinvertebrate sampling be completed in 2023, and the approved *Water Quality Study* be modified to include the additional West Branch temperature monitoring proposed by GLHA.

[21] Zooplankton are small, aquatic microorganisms in the water column that include crustaceans, rotifers, open water insect larvae, and aquatic mites.

## 5. Fish Assemblage Study

Background

The SPD required GLHA to conduct a *Fish Assemblage Study* for the Ripogenus and Penobscot Mills Projects to fill certain data gaps. The study included both desktop (review of existing information) and field sampling components. The specific goals and objectives of the study were to: (1) provide contemporary data to assess the potential effects of the proposed relicensing of the projects on the fish assemblage in the project areas; and (2) use the information to determine if the Ripogenus impoundment maintains an indigenous fish assemblage. For the Ripogenus Project, field sampling was determined to be necessary. Sampling areas included: (1) the six sub-basins of the Ripogenus impoundment,[22] the Upper Gorge, and the West Branch from McKay Station downstream to Nesowaduehunk Falls. For the Penobscot Mills Project, available fisheries data were assembled. Areas from which existing fisheries data were assembled included all the project impoundments, as well as the West Branch downstream from Stone Dam, the West Branch downstream from Dolby and East Mill Dams, and Millinocket Stream downstream from Millinocket Lake Storage Dam.

GLHA conducted the *Fish Assemblage Study* in accordance with the SPD, with one significant exception: no spring sampling occurred at the Ripogenus Project. Otherwise, methodology employed as part of the study varied with sampling location.[23] Sampling techniques used during the summer and fall of 2022 for the Ripogenus impoundment included boat electrofishing and trap netting. Boat electrofishing was conducted during the evening or nighttime hours in nearshore and shallow water habitats. Trap netting was conducted to supplement the boat electrofishing within the Ripogenus impoundment. During each sampling season, trap nets were deployed at a total of five tributary confluence locations throughout the impoundment. Species richness and composition, relative abundance, and, for selected fish species, size distributions were calculated. The condition of landlocked salmon was also assessed. Sampling in the Upper Gorge included minnow traps, angling, and backpack electrofishing, with the condition for all captured salmonids being calculated. In the West Branch downstream from McKay Station, sampling methodology followed that described in Yoder *et al*.

[22] Ripogenus Lake, Caribou Lake, Chesuncook Lake, Moose Pond, Brandy Pond, and Black Pond.

[23] The details of the methodology used for sampling within the different project areas are described in section 4.1, *Ripogenus Project*, of the *Fish Assemblage Study Report* [Appendix D of the ISR].

(2015),[24] including raft electrofishing, which was completed at four sites within the reach.[25]

As required by the SPD, GLHA compiled information from all fish assemblage studies previously conducted in the Penobscot Mills Project area and assessed gaps in the fisheries information.[26] Fish assemblage data were also obtained from boat electrofishing surveys conducted as a part of the upstream American eel study conducted between June and October 2022 at the East Millinocket Development, which included bycatch data for other species.

Information collected in 2022 demonstrates project waters support a diverse fisheries community. A total of 23 fish species were collected from Ripogenus Project waters and 25 species were confirmed to occur in Penobscot Mills Project waters. The fish assemblage included a variety of game and non-game species, many of which are indigenous to the area,[27] including native minnows and sunfishes. Landlocked salmon, the principal sport fish species managed by Maine DIFW, were found to be throughout the Ripogenus and Penobscot Mills Project waters. The salmon population in the North Twin impoundment was found to be self-supporting.

As part of the study, GLHA compared historical fish species data for the Ripogenus impoundment with the 2022 survey results. Historical sampling identified a total of 20 fish species, 13 of which were collected during the 2022 sampling. Fish species historically detected in the Ripogenus Project area but absent from the 2022 Ripogenus impoundment catch included lake trout, lake whitefish, American eel, longnose sucker, blacknose dace, creek chub, and ninespine stickleback.

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[24] Yoder *et al*. (2015) describes methods and designs for assessing fish assemblages in non-wadable rivers in New England.

[25] The sites included: within and downstream from Big Eddy, a previous Index of Biotic Integrity (IBI) site; immediately downstream from Little A Falls; the upper section of the Nesowadnehunk "deadwater;" and immediately downstream from Nesowadnehunk Falls, a previous IBI site.

[26] Historical, unpublished fish species inventory data were compiled from water bodies within the project area. Data from catches summarized in Midwest Biodiversity Institute (2005) were reviewed and summarized. Historical stocking data were summarized by year, waterbody, and species to describe game fish stocking patterns.

[27] Indigenous fish species known from the region include brook trout, American eel, yellow perch, white sucker, rainbow smelt, longnose sucker, lake whitefish, lake chub, golden shiner, fall fish, creek chub, common shiner, slimy sculpin, burbot, brown bullhead, and blacknose dace.

Requested Study Modifications

In his comments, Edward Spear claims that the *Fish Assemblage Study* does not accomplish agency and stakeholder goals. Mr. Spear also claims that there are major omissions in the study report, which he asserts are the result of a flawed study design or limitation of sampling gear. The major omissions cited by Mr. Spear include: (1) scale samples; (2) spring sampling; (3) smelt abundance data; (4) salmon or smelt length distributions;[28] (5) redd[29] surveys or dietary information collected for landlocked salmon; and (6) sampling in the West Branch downstream from North Twin Dam. In addition, Mr. Spear states that both boat electrofishing and trap netting are "shallow" water sampling methods and, thus are "biased." According to Mr. Spear, sampling with these methods cannot be used to describe or quantify the Ripogenus impoundment's fish community. Mr. Spear requests that GLHA revise the *Fish Assemblage Study Report* to address his concerns.

In its comments, Maine TU states that the study uses data collected in 2003, which is 20 years old, and asserts that new data is needed to confirm the presence of native fish. Maine TU also states that scale samples and fish metrics were not obtained. Maine TU, however, does not request specific modifications to the approved *Fish Assemblage Study*.

In its comments, Maine DIFW states that the results of the *Fish Assemblage Study* were as expected. The fish species identified by GLHA in the Ripogenus impoundment and the West Branch downstream from Ripogenus Dam are consistent with Maine DIFW's species inventory for these waters and are typical of waters in the region. Maine DIFW indicates that, based on its understanding, the study was intended to only identify species and not provide any indices of abundance, as this would be impossible given the size of the lake, and the various species and life histories involved.

Comments on Requested Study Modifications

In its reply comments, GLHA asserts that the study's design was not flawed. GLHA states that fish assemblage data were collected in 2022 for the Ripogenus impoundment and the West Branch downstream from McKay Station, and that the data were compared to data collected by the Midwest Biodiversity Institute in 2004 and 2009 to determine if any major changes in the fish assemblage had occurred during that 20-year period. GLHA states that the results of the sampling provide updated information on the fish assemblage at the Ripogenus Project, which GLHA asserts was the primary purpose of the study at the project. GLHA also states that the fish sampling relied on

[28] GLHA provided length distribution graphs for landlocked salmon collected during the Ripogenus Project sampling. *See* ISR, Appendix B-Attachment 3.

[29] A redd is a depression created by the female salmon for laying eggs.

traditional fisheries sampling techniques (e.g., electrofishing methods used in the West Branch followed that described in Yoder *et al*. (2015)). Moreover, GLHA states that sampling methods and locations were selected in consultation with Maine DIFW, the U.S. Fish and Wildlife Service (FWS), and Maine TU. Finally, GLHA asserts that the intent of the *Fish Assemblage Study* for the Ripogenus Project was to document the current fish community in the project area, not to collect: (1) information on the West Branch fisheries, landlocked salmon spawning, or salmon diets; or (2) data to derive age and growth statistics on fish populations (i.e., collecting scale samples), estimate smelt abundance, or estimate biomass and population numbers within the study area. GLHA concludes that the goals of the study for the Ripogenus Project were met.

Regarding spring sampling, GLHA states that based on the timing of when the SPD was issued, spring surveys could not be completed. GLHA notes that "the need for spring or late fall sampling is driven primarily by the spring migration of adult anadromous[[30]] species, such as river herring, and the outmigration of young-of-the-year anadromous fish in the fall." GLHA asserts that, since anadromous fish are not present in the West Branch, summer and early-fall sampling is sufficient to characterize the fish assemblage in the West Branch, and claims that a spring survey would not provide new or unique information.

Discussion and Recommendation

A goal of the *Fish Assemblage Study* was to characterize the fish community within the Ripogenus Project area. The *Fish Assemblage Study Report* provides a desktop review of historical fishery information from the project area (including unpublished data collected by Maine DIFW; e.g., smelt drift data), as well as information based on data collected during 2022 fish surveys.

The *Fish Assemblage Study Report* (*see* section 5.0, *Results*, in Appendix D of the ISR) provides Ripogenus Project area fish community information on: (1) the fish community (presence, absence, and distribution) in the Ripogenus impoundment and the West Branch downstream from Ripogenus Dam; (2) habitat and water quality at the sampling locations; (3) species richness, by season, sampling gear type, and sampling location; (4) species composition (number and percent), by season, sampling gear type, and sampling location; (5) relative abundance (catch per unit effort), by season and sampling gear type; (6) biometrics information (length and weight) for fish species

[30] The term "anadromous" refers to a life history strategy of fishes where fish migrate between fresh- and salt-water. Reproduction occurs in freshwater and rearing to the adult stage occurs in the ocean.

captured; (7) the condition of landlocked salmon (as measured by Fulton's K Factor[31]) and brook trout; (8) length frequency distributions for several fish species;[32] and (9) fish assemblage condition metrics, as measured by Index of Biotic Integrity and Diadromous Index of Biotic Integrity scores, for the West Branch downstream from McKay Station. Thus, the information in the *Fish Assemblage Study Report* provides updated information on the fish community at the Ripogenus Project, which meets the goal of characterizing the fish community within the Ripogenus Project area [section 5.9(b)(1)].

The SPD required fish sampling in the spring, summer, and fall. The intent of sampling in the spring was not to collect information on migrating anadromous fish, but rather collect information on resident species in the system during one of the most biologically active times of the year. While sampling in the summer and early fall provides useful information to characterize the fish assemblage within the Ripogenus impoundment and the West Branch downstream from Ripogenus Dam, it is not sufficient to determine the fish community structure in the spring and to fully characterize the fish assemblage at the project [section 5.9(b)(6)]. Sampling in the summer and fall, only, does not provide data for the spring spawning period and misses sampling the species active at that time (e.g., smelt).[33] Without fish assemblage information for the spring season, Commission staff will be unable to complete a full NEPA review of potential project effects and make recommendations regarding license requirements [section 5.9(b)(5)]. For these reasons, we recommend GLHA complete the *Fish Assemblage Study* as required in the SPD and conducted spring sampling in 2024. This includes sampling in the Ripogenus impoundment, Upper Gorge, and the West Branch downstream from McKay Station, at sampling locations determined in consultation with Maine DIFW and Maine TU.

Mr. Spear and Maine TU assert that the study design is flawed because various types of information are missing from the report, and that the report is biased as a result and cannot be relied upon for making decisions in the current relicensing proceeding. The approved *Fish Assemblage Study* was not designed to collect the types of information that Mr. Spear and Maine TU state is missing. For example, the approved

[31] Fultin's K Factor is a measure of a fish's condition. It is the weight of a fish divided by the length cubed, then multiplied by 100. The higher the number, the better a fish's condition. The number 1 indicates a "normal" fish in "ok" condition.

[32] Length distribution data for landlocked salmon collected, as well as captured by anglers, downstream from McKay Station in 2021 and 2022 is provided in the ISR (*see* Appendix B, Attachment 3).

[33] Other spring/early summer spawners that occur in project waters include white and yellow perch, brown bullhead, white and longnose sucker, blacknose dace, and slimy sculpin.

study did not require: (1) smelt surveys;[34] (2) the collection of scales for age and growth analysis;[35] (3) salmon dietary information;[36] (4) calculation of proportional stock densities; (5) salmon redd surveys; or (6) an assessment of the status of the sport fishery in the area. Thus, the report is not flawed due to omissions. The information in the *Fish Assemblage Study Report*, once completed (with spring sampling at the Ripogenus Project), will be sufficient to inform a licensing decision for the projects [section 5.9(b)(5)]. Moreover, no new information has come to light that supports the need to collect the requested information [section 5.15(e)(4)]. Therefore, we do not recommend, apart from the spring sampling, that GLHA collect the requested information.

With respect to Maine TU's request for new, fresh information to confirm the presence of native fish, the approved *Fish Assemblage Study* included fish and aquatic surveys in the Ripogenus impoundment and in the West Branch downstream from McKay Station. For the Ripogenus Project, the *Fish Assemblage Study Report* documented this sampling effort, including noting the presence of a mix of 23 native and non-native species at the project. The report also included a comparison between 2022 and 2004/2009 surveys, which showed that: (1) the fish assemblage in the Ripogenus Project area has changed little over the 20 year period; and (2) the ecological health of the river scores (derived from the New England Large Rivers IBI model) are consistent between the two surveys. As stated above, the information in the *Fish Assemblage Study Report*, along with the additional sampling required in this determination, will be sufficient to characterize the fish community in the project area [section 5.9(b)(4)]. Therefore, updated information to confirm the presence of native fish is not needed.

For the Penobscot Mills Project area, the SPD did not require surveys. Instead, it anticipated that, if existing information proved insufficient for achieving the goal of describing the current fishery, and important data gaps in the fisheries information remained, additional studies to obtain that information could be considered after filing of the ISR. Based on our review of the ISR (described above), the information in the *Fish Assemblage Study* is sufficient to describe the existing fishery in the Penobscot Mills

[34] Maine DIFW conducted a smelt drift survey in the West Branch downstream from McKay Station in 2021, and this information was included in the *Fish Assemblage Study Report*. Maine DIFW also conducted smelt drift work in 2022. While the 2022 data may be currently unavailable, it should be included in an updated *Fish Assemblage Study Report* filed as part of the USR. Available smelt drift data were provided in table 5, page D-45 of the ISR (Appendix D).

[35] Biometric age and growth information for salmonids in the Ripogenus impoundment was provided by Maine DIFW and is included in the ISR (Appendix D, page D-43).

[36] Maine DIFW provided stomach content analysis to GLHA, which is provided on page D-43 (Appendix D) of the ISR.

Project area [section 5.9(b)(4)]. Therefore, we do not recommend modifying the approved *Fish Assemblage Study* to require field sampling within the Penobscot Mills Project area.

**6. Instream Flow and Habitat Assessment of the West Branch Downstream from Stone Dam Study**

Background

The SPD required GLHA to conduct an *Instream Flow and Habitat Assessment of the West Branch Downstream from Stone Dam Study*. The goal of the study was to assess the relationship between flow and aquatic habitat in the West Branch downstream from Stone Dam using a previously developed Physical Habitat Simulation (PHABSIM) model. The specific objectives were to: (1) assess the relationship between flow and aquatic habitat for brook trout, landlocked salmon, and aquatic macroinvertebrates in the study reach; (2) assess the potential of the current project operating regime and minimum flows to support a coldwater fishery between Stone Dam and Grand Falls, which is a natural falls located about 2.7 miles downstream from the dam; and (3) evaluate the potential for alternative minimum flows in the reach to support a seasonal, coldwater sport fishery.[37]

The study applied updated habitat suitability criteria (HSC)[38] reflecting contemporary resource management objectives.[39] Modeling was conducted using standard procedures described by Bovee (1982) and Bovee, *et al*. (1998).[40] The basic inputs to PHABSIM are the hydraulic and habitat suitability simulations of stream reaches using hydraulic parameters and habitat suitability criteria. The result is a quantitative habitat suitability index (summarized as weighted usable area, or WUA) that is derived by rating the hydraulics using HSC for the variables of depth, velocity, and substrate/cover specific to each species of interest. The flows modeled ranged from 3 cfs to 2,000 cfs. GLHA conducted site visits in August 2022 with personnel from Maine

[37] Habitat upstream of Grand Falls is dominated by riffles and runs with scattered braided channels, with predominantly boulder substrate.

[38] Habitat suitability criteria are selected prior to conducting modeling.

[39] GLHA consulted with Maine DIFW and Maine DEP staff to finalize the HSC for adult brook trout and macroinvertebrates prior to conducting modeling. Maine DIFW concluded that the HSC for landlocked salmon used in the original model were still valid for use in the 2022 study.

[40] Additional details regarding the IFIM modeling approach are described in section 4.0, *Methodology*, of the *Instream Flow and Habitat Assessment of the West Branch Downstream from Stone Dam Study Report* (Appendix F of the ISR).

DIFW, Maine DEP, FWS, the National Marine Fisheries Service, the Maine Department of Marine Resources (Maine DMR) and the Penobscot Indian Nation. The group examined the study area, discussed the existing PHABSIM model, and confirmed that the previous Instream Flow Incremental Methodology (IFIM) study sites were suitable for purposes of this updated study.

The results and conclusions of the 2022 flow study are:

(1) Based on brook trout temperature tolerances, flows with water temperatures that support a put-and-take coldwater fisheries (especially for brook trout) would likely occur from April into July. Flow during the remainder of the year would support habitat for macroinvertebrates.

(2) A leakage[41] flow of 50 cfs provides 34%, 40%, and 57% of the maximum potential habitat suitability[42] for macroinvertebrates, adult brook trout, and juvenile brook trout, respectively; and 59% and 15% of the maximum habitat suitability for juvenile and adult landlocked salmon, respectively.

(3) A leakage flow of 100 cfs provides 45%, 49%, and 64% of the maximum potential habitat suitability for macroinvertebrates, adult brook trout, and juvenile brook trout, respectively; and 70% and 28% of the maximum habitat suitability for juvenile and adult landlocked salmon, respectively.

(4) The range of existing operational flows, when accounting for spill flows at Stone Dam,[43] provides at least 40% to 64% of the maximum suitable habitat for brook trout, and 15% to 70% of the maximum suitable habitat for salmon, with periodically higher suitability due to spill flows.

(5) The modeling estimates that the best habitat suitability for adult brook trout and landlocked salmon occurs with minimum flows between 700 cfs and 1,000 cfs.

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[41] Leakage from Stone Dam can vary depending on the seasonal impact of flows and ice on the flashboards, as well as short-term wind/wave action, and has been estimated to vary from 3 cfs to 100 cfs.

[42] The term "maximum habitat suitability" is used here merely as a reference point to relate how various flows effect habitat and not as a metric. Fishability (i.e., the ability for anglers to be able to safely wade and reach game fish lies within casting distance) may be more relevant than maximizing habitat suitability.

[43] GLHA does not define in the study report what is meant by operational flows in the context of Stone Dam operations. Based on the operations data filed by GLHA on May 22, 2023, the range of flows spilled at Stone Dam (defined as non-operational flows), from 2000 to 2022, was 17 cfs to 24,235 cfs.

Requested Study Modifications

In his comments, Edward Spear argues that the flow study fails to meet the study goal of assessing the relationship between flow and aquatic habitat in the West Branch downstream from Stone Dam. Mr. Spear asserts that the HSC for brook trout need to be revisited and either empirically derived or taken from peer reviewed literature. Mr. Spear states that the HSC for adult brook trout used in the flow study are unsuitable for a large, wide riverine environment like the West Branch downstream from Stone Dam. Mr. Spear recommends the use of HSC developed for the Dead River (Flagstaff Storage Project No. 2615). Mr. Spear also asserts that the study report fails to address where and how anglers would locate a place to fish and recommends that the study (and associated report) be updated to include pools and deep runs where anglers would choose to fish.

In its comments, Maine TU references a "persistent habitat analysis" conducted by FirstLight for the Turners Falls Project No. 1889 on the Connecticut River in Massachusetts. Maine TU states that a similar analysis would be reasonable for the West Branch downstream from Stone Dam.

Comments on Requested Study Modifications

In its reply comments, GLHA states that the HSC used in the study were developed according to IFIM study protocols, and Maine DIFW and Maine DEP were consulted for input on the HSC used, prior to the model being finalized. GLHA indicates that Maine DIFW biologists applied professional judgment, relying on department brook trout experts, to arrive at the HSC used in the study, and that the curves were recommended by Maine DIFW biologists.

Regarding Maine TU's request for a "persistent habitat analysis," GLHA states that such analysis is not appropriate for the river reach downstream from the Millinocket Development. GLHA indicates that such an analysis is done for river reaches downstream from peaking facilities, rather than run-of-river facilities like the Millinocket Development.[44] GLHA further explains that the method evaluates generation flows versus base flows, with the intent of altering peaking operations to optimize habitat suitability.

Discussion and Recommendation

The goal of the 2022 flow study was to assess the relationship between flow and aquatic habitat in the West Branch downstream from Stone Dam using an updated

[44] Typical impoundment elevation fluctuations are limited to 1 foot or less from top of flashboards when installed or crest of dam without flashboards.

version of the 1989 IFIM model. As part of the approved study, GLHA was to consult with Maine DIFW, Maine DEP, and other interested stakeholders for input on HSC criteria. GLHA carried out this consultation. Candidate curves obtained and reviewed by a team of stakeholder biologists were gathered from large river IFIM studies, including those conducted on the Allagash and Magalloway Rivers. The study report includes the results of the modeling, including: (1) descriptions of the reach hydraulics (e.g., depth, velocity, and wetted area) under different flows; and (2) data in graphic and tabular form depicting flow/habitat relationships for the species and life stages of brook trout and landlocked salmon, and for macroinvertebrates. The study report also includes a discussion of: (1) seasonal suitability of the reach for a managed (put-and-take) salmonid fishery; (2) the effects of existing, year-round project operation on fish and macroinvertebrates; and (3) potential for alternative minimum flows in the reach. Thus, the flow study conducted in 2022 meets the study's goals and objectives described in the SPD [section 5.9(b)(1)].

Regarding Mr. Spear's assertion concerning the origin and appropriateness of the HSC rating curves used for brook trout, GLHA consulted with Maine DIFW and Maine DEP to finalize the HSC for brook trout and macroinvertebrates prior to conducting the modeling. HSC from IFIM studies conducted in Maine, Connecticut, Massachusetts, New York, Pennsylvania, and Michigan were considered. Moreover, through consultation with the agencies, it was determined that the study area on the West Branch is composed of riffles, runs, and pocket pools with poor cover, and dominated by boulder and some large cobble substrates. Therefore, the HSC used in the modeling for the West Branch were appropriate. Using the HSC from the Dead River (a tributary to the Kennebec River in Maine), as suggested by Mr. Spear, is unnecessary and would not likely alter the results of the flow study which used appropriate HSC [section 5.9(b)(6)]. Therefore, we do not recommend modifying the study design to use the HSC from the Dead River.

As to Mr. Spear's recommendation to include, as part of the assessment, pools and deep runs where anglers would choose to fish, the 2022 IFIM study used the model developed in 1989 and included two study sites with 13 transects. The two study sites were chosen to represent the dominant habitat types in the upper and lower sections of the 2.7-mile-long study reach. Habitat types in this reach are dominated by riffles and runs with scattered braided channels, with predominantly boulder substrates.[45] The 2022

[45] The upper portion of the West Branch downstream from Stone Dam (location of study site 2) is wider and of lower gradient than the lower portion (location of study site 1) and occupies 10,692 liner feet of the channel (Normandeau Associates, 1989). The geomorphology in this portion of the West Branch is chiefly alluvial with a few scattered bedrock-controlled areas. The lower reach is narrower, steeper and has a better-

study built upon those widely accepted protocols (e.g., Bovee, 1982; Bovee et al., 1998) [section 5.9(b)(6)]. Because pools and deep runs are not the dominant habitat types in the reach and using non-dominant habitat types would run counter to the accepted protocols, we do not recommend that GLHA modify the study design to include pools and deep runs where anglers would choose to fish.

Finally, regarding Maine TU's request for a "persistent habitat analysis," or habitat duration analysis, such an analysis is typically done in reaches downstream from peaking projects to evaluate how long a given amount of habitat is available for use by aquatic organisms at particular flows. Stone Dam is not operated in this fashion. Instead, flows exceeding the project's generation capacity are spilled to maintain impoundment elevations at a relatively constant level. These are not controlled generation releases, as would be the case with a peaking project. Even if this reach of the West Branch had an established minimum flow, flows in excess of the Millinocket powerhouse's capacity would continue to spill over the Stone Dam spillway and GLHA would continue to have no control over frequency or magnitude of these spill flows [section 5.9(b)(5)]. For this reason, we do not recommend modifying the flow study to include a "persistent habitat analysis."

**7. North Twin Impoundment Tributary Access Survey Study**

Background

The SPD required GLHA to conduct a *North Twin Impoundment Tributary Access Survey*. The goals of the survey were to assess connectivity and spawning conditions for landlocked salmon in tributaries to the North Twin impoundment, as well as determine if there are barriers to fish movement into the tributaries during drawdowns of the North Twin impoundment. The specific objectives were to: (1) identify tributaries to the North Twin impoundment that are used by landlocked salmon for spawning or that have habitat suitable for spawning; (2) survey the identified tributary streams and identify potential fish passage barriers both natural and project-related near their confluence with the North Twin impoundment; (3) document evidence of spawning (e.g., spawning behavior and redd formation); and (4) evaluate the effects of the typical seasonal impoundment fluctuation on tributary access by landlocked salmon during critical life stage(s). The study area included eight tributaries to the North Twin impoundment.

Reconnaissance surveys of the West Branch upstream of Ambajejus Lake, Nahmakanta Stream, Partridge Brook, Jo Mary Stream, Twitchell Brook, Wadleigh Stream, Ragged Brook, and an unnamed brook on the southern shoreline of North Twin

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defined channel and occupies 3,564 linear feet of the channel (Normandeau Associates, 1989). The substrate in both reaches is predominantly large boulders.

Lake (a sub-basin of the North Twin impoundment) were made in July 2022, when North Twin impoundment water levels were at a typical summer level. Photographs of each tributary were taken to characterize each site. Points of interest were georeferenced with a hand-held Global Positioning System (GPS) unit. The mouths of the tributaries were: (1) assessed for potential barriers to adult landlocked salmon movement (e.g., ledge drops, debris jams, and wide shallow channel reaches); and (2) surveyed (by optical transit level) to obtain channel slope and width.

Based on consultation with Maine DIFW, the West Branch at Ambajejus Falls,[46] Nahmakanta Stream, and Jo Mary Stream were identified for further survey work. These three tributaries were to be assessed and re-surveyed during the fall spawning period under seasonal drawdown conditions. GLHA was to examine the area immediately above the high-water mark in each tributary[47] and the shoal area for potential spawning habitat and/or evidence of redd construction in 2022.[48]

Requested Study Modifications

In its comments, Maine DIFW states that field conditions were unsuitable in fall 2022 for completing the tributary surveys, as planned, due to extended rainfall in October and November 2022, and that GLHA anticipates completing fieldwork in the fall of 2023.[49]

Comments on Requested Study Modifications

In its reply comments, GLHA states that it is intending to complete the approved *North Twin Tributary Access Survey* in 2023. Regarding the scope of the partially completed *North Twin Tributary Access Survey*, GLHA clarifies that, in addition to evaluating potential tributary barriers, GLHA intends to survey bed elevations in coves

[46] Ambajejus Falls is a riffle/rapid complex located at the confluence of the West Branch. Ambajejus Lake is a sub-basin of the North Twin impoundment.

[47] The SPD required that GLHA examine the tributaries immediately above the North Twin impoundment's high-water elevation for a horizontal distance upstream in the tributary of 100 meters (i.e., 328 feet).

[48] Efforts were made to schedule the fall surveys for the three identified tributaries during October and early November of 2022. Due to high inflows, typical fall drawdown levels for the North Twin impoundment were not achieved and it was not possible to conduct the additional stream channel survey work during the fall 2022.

[49] Maine DIFW, Maine TU, and Mr. Spear also repeated requests for an alternative methodology utilizing radio tagging, which we addressed in the May 13, 2022, SPD. As noted in the cover letter, we do not repeat that analysis here.

adjacent to the targeted tributaries to determine if they could become dewatered under the potential range of seasonal drawdowns. GLHA would attempt to identify potential shoal areas in coves in the North Twin impoundment that have substrates suitable for redd formation (e.g., gravel) adjacent to Nahmakanta and Jo-Mary streams, as well as the West Branch through soundings or other means. GLHA would consult with Maine DIFW concerning the location of specific offshore spawning shoals that should be targeted. GLHA would then determine the elevation of these beds to determine if the identified areas become unsuitably shallow during fall drawdowns, over the salmon spawning and incubation period, as a function of project operation.

Discussion and Recommendation

The *North Twin Impoundment Tributary Access Survey Study* was conducted as provided for in the SPD; though the study occurred during anomalous environmental conditions [section 5.15(d)(2)]. The combination of atypical, high impoundment levels and high stream discharges created circumstances that prevented potential instream barriers from being adequately detected or surveyed. The protracted period of unseasonably warm weather also delayed and/or altered spawning behavior of salmon to the extent that it was not feasible to document evidence of spawning. Therefore, we recommend GLHA complete the *North Twin Tributary Access Survey* approved in the SPD in 2023, with GLHA's proposal, as described above, to evaluate shoal habitat in the North Twin impoundment. We also recommend GLHA consult with Maine DIFW in the final design and implementation on this study.

**8. Upstream American Eel Passage Assessment**

Background

In accordance with the SPD, GLHA conducted an *Upstream American Eel Passage Assessment* at the East Millinocket Development. The goals of the study were to: (1) assess whether eels are found in or near the East Millinocket tailwater area, congregate at or near the base of East Millinocket Dam, or attempt to migrate upstream over East Millinocket Dam; and (2) collect information about the timing of movements, behavior, and the approximate size of juvenile eels observed at the dam. GLHA also completed a pilot study, using eDNA techniques described by Chin *et al*. (2021),[50] to determine if it is feasible to use eDNA to assess the presence and relative distribution of eels in the West Branch. The study area for the assessment included East Millinocket

[50] Environmental DNA (eDNA) is organismal DNA that can be found in the environment. Environmental DNA originates from cellular material shed by organisms (via skin, excrement, etc.) into aquatic or terrestrial environments that can be sampled and monitored using new, molecular methods.

Dam and the tailwater area. For the eDNA study, the study area included select reaches of the West Branch (downstream from the East Millinocket Development), the lower East Branch of the Penobscot River, and the mainstem Penobscot River.

The survey methodology approved in the SPD included nighttime visual surveys (20 surveys from June 1 to October 17, 2022),[51] boat electrofishing surveys,[52] eel traps,[53] and eDNA techniques.[54] A total of 556 eels were observed during the nighttime visual surveys at East Millinocket Dam, and most (96 percent) were seen immediately downstream from an existing large, steel gate on the river left side (looking downstream) of the dam in July and August. Juvenile eels were able to ascend the dam face but appeared unable to readily pass through or under the steel gate. Data from monthly boat electrofishing surveys demonstrated that most small (4- to 8-inch) juvenile eels were present at the base of the dam, with the highest densities (95 percent) in June and July. No eels were collected in the eel traps. Finally, laboratory analysis of water samples for the eDNA study also showed that eels were present at all sampling locations, including at East Millinocket Dam, but no meaningful relationship between eDNA concentrations and eel density could be established.

In its comments on the ISR and the ISR Meeting Summary, Maine DMR commented on the study methodology and requested that additional information be provided in the study report. GLHA provided much of this information in its reply comments. In its comments, Maine TU commented on the significance of the number of juvenile eels observed and collected downstream from East Millinocket Dam. Neither

[51] Survey techniques included repeated visual, nighttime observations using binoculars and spotlights with infrared lighting to observe eels during non-spill conditions. Each survey lasted approximately 1 to 2 hours and took place after sunset between 6:30 p.m. and 11 p.m. Survey areas at East Millinocket Dam included the dam face, spill gates, wooden flashboard section of the spillway, and concrete piers, as well as the dam's right abutment area.

[52] Nightly boat electrofishing was completed immediately downstream from East Millinocket Dam, mostly in a large riverine pool downstream from the toe of the dam. Surveys were completed on June 29, July 20, August 24, September 21, and October 10, and occurred along shallow areas less than 6 feet deep, along the shoreline and near the base of the dam. Electrofishing survey time range from 27 to 52 minutes.

[53] Two eel traps were installed downstream from East Millinocket Dam on the left side of the river (looking downstream). The traps were deployed from June 28 through July 28, 2022, for 48 to 96 hours per week. Each trap consisted of a covered eel ramp with eel substrates, a collection trap, batteries, solar panels, and water pumps.

[54] Details of the survey methodology are provided in Appendix H of the ISR.

Maine DMR, nor Maine TU, however, requested specific modifications to the approved study.

Proposed Study Modifications

Based on the upstream eel monitoring results at the East Millinocket Development and discussions with Maine DMR, GLHA, in its reply comments, proposes to monitor juvenile eels at Dolby Dam, Millinocket Lake Storage Dam, Stone Dam, and North Twin Dam in 2023.[55] The goals of the modified study would be to: (1) obtain information about the presence of juvenile eels at the project dams; (2) observe and record if and where eels congregate, and if they attempt to migrate upstream at project features (e.g., face of dam, gates, etc.); (3) collect information on the size of the eels observed; and (4) use the data collected, in combination with that collected in 2022 at East Millinocket Dam, to consider potential measures to be included in a license application.

GLHA's proposed methodology would include nighttime visual surveys once a week, by foot, at each of the four dams, from July through the last week of September. The nighttime surveys would last about 1 to 2 hours at each site, starting just before or after sunset. Areas would be visually searched with binoculars and red spotlights. Survey time, weather conditions, general river flow conditions, presence and location of eels, size classes of eels, and observable migratory behavior (e.g., congregating or attempting to ascend structures) would be recorded. Surveys would be completed during non-spill conditions. In addition to the nighttime visual surveys, GLHA also proposes two nighttime backpack or boat electrofishing surveys downstream from each of the four dams in July, August, or September, if conditions are safe and sampling is feasible. Each survey would last about 20-30 minutes.

Comments on Proposed Study Modifications

In its comments, Maine TU states that it supports GLHA's proposal to conduct nighttime eel studies at the upstream Penobscot Mills dams in 2023.

Discussion and Recommendation

GLHA's *Upstream American Eel Passage Study* documented the presence of juvenile eels in the West Branch downstream from East Millinocket Dam. A total of 556

[55] GLHA developed a draft plan for monitoring juvenile eels at Dolby Dam, Millinocket Lake Storage Dam, Stone Dam, and North Twin Dam in 2023. This draft plan was sent to FWS, Maine DMR, and the Penobscot Indian Nation via email on June 2, 2023. FWS commented on the draft plan via email on June 15, 2023. GLHA addressed FWS's comments in the proposed plan.

eels were observed during the nighttime visual surveys;[56] 98% (545) of which were counted during the months of July (371), August (162), and September (12).[57] The remaining 11 eels were observed in June.

The results of the study indicated that considerably more eels are present in this part of the West Branch than previously documented [section 5.9(b)(4)]. More juvenile eels were observed during this study at East Millinocket Dam than have been documented passing the downstream Medway Dam. These results confirm that juvenile eels can pass in-river obstructions such as dams under the right conditions. Given the large number of eels observed ascending East Millinocket Dam, it seems likely that eels occur in the system upstream of the East Millinocket Development. Thus, monitoring eels at the remaining four dams that compose the Penobscot Mills Project is warranted. The outcome of such monitoring would help GLHA identify appropriate measures to enhance upstream eel passage at the project, as well as eel movement in the West Branch [section 5.9(b)(5)].

During the study, GLHA used boat electrofishing, trapping, and eDNA sampling, in addition to repeated nighttime visual surveys. As described in the ISR, trapping and eDNA sampling provided little, if any, additional information about the presence and behavior of eels at the East Millinocket Development [section 5.9(b)(7)]. For these reasons, GLHA is proposing to use nighttime visual surveys for the study, with some backpack/boat electrofishing (if conditions allow). Repeated nighttime surveys have been successful at several hydropower projects in Maine to document the presence and behavior of juvenile eels.[58] Moreover, Haro and Gephard (2023) state that the primary technique for observing eels at dams is nighttime observational surveys by foot. Thus, GLHA's proposed methodology is scientifically acceptable in the region, and is a locally demonstrated method of observing eels and should be sufficient to address the goals of the study without further need of trapping and eDNA sampling [section 5.9(b)(6)].

GLHA proposes to monitor eels during the months of July, August, and September 2023. For the 2022 study at East Millinocket Dam, nearly all the juvenile eels observed during the nighttime visual surveys (98%) and caught during the boat electrofishing

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[56] A total of 153 eels (nearly 45% of the total species caught) were caught during the boat electrofishing surveys.

[57] Though required by the SPD, May was not sampled due to high flows and unsafe conditions at the East Millinocket Dam site.

[58] Nighttime visual surveys have been successfully used at the Williams, West Enfield, Stillwater, Orono, Milford, Lowell Tannery, Lower Barker, and American Tissue Hydropower Projects in recent years to provide information about the occurrence and behavior of juvenile eels in Maine rivers. *See* GLHA's August 7, 2023 Filing at Appendix F-1.

efforts (99%) were in the months of July (including a June 29 sampling event), August, and September. It is reasonable to expect that upstream passage timing would be similar at the upstream dams. Therefore, the sampling season proposed by GHLA would likely capture the majority of upstream juvenile eel movement in the West Branch, without the expense of requiring GLHA to sample in the months when upstream eel migration is less likely [section 5.9(b)(7)].

For the above reasons, we recommend that the *Upstream American Eel Passage Assessment* be modified to include a second study season of eel monitoring in 2023, as proposed by GLHA, at Dolby Dam, Millinocket Lake Storage Dam, Stone Dam, and North Twin Dam. We specifically recommend that GLHA add sampling at the four dams upstream of East Millinocket Dam, follow the methods discussed above, and consult with FWS, Maine DMR, and the Penobscot Indian Nation in implementing the study. The results of this eel monitoring should be included in a final *Upstream American Eel Passage Assessment Report* provided with the USR.

**15. Common Loon Management Plan Assessment**

Background

The SPD required GLHA to evaluate information collected over the term of the current license related to common loons at the Ripogenus impoundment, including information on how the loon management plan for the project has been implemented. The assessment considered: (1) the results of the 1998 and 1999 spring and summer loon survey; (2) the results of the 2000-2010 annual loon artificial nest and natural nest monitoring, including, to the extent the information was available, where the artificial rafts were deployed; (3) procedures used to deploy and maintain the artificial nests from 2011 to 2021; and (4) an evaluation of the artificial nest locations in relation to bathymetry maps and historic impoundment elevation data. Information from the study would be used to inform a decision on the need for measures for common loons at the Ripogenus Project.

Requested Study Modification

In his comments, Edward Spear asserts that GLHA did not conduct loon surveys on the West Branch downstream from McKay Station. Mr. Spear states that a pair of loons is currently nesting in Neoowadnehunk Deadwater, although the location of the nest is unknown. He requests no specific modifications to the approved loon study, but states that GLHA should include the West Branch reaches downstream from McKay Station in all future loon surveys and evaluate the effects of up and down peaking flows on nesting success.

Comments on Requested Study Modifications

GLHA did not comment on Mr. Spear's recommendation regarding future loon surveys.

Discussion and Recommendation

The results from GLHA's *Common Loon Management Plan Assessment* indicate that the nest platforms were either not used, or loons using the platforms had limited or no reproductive success over the duration of the monitoring from 2000 to 2010. GLHA indicates that numerous factors contributed to failed nesting and lack of chick success, including fluctuations in the impoundment elevation (both increases and decreases in water levels), predation of eggs or chicks, and abandonment of the nest for unknown reasons. The Caribou and Chesuncook Lake Camp Association, Chesuncook Village Association, and the Chesuncook Dam Camp Association (collectively, Camp Associations) commented that that the results of the loon assessment study are a clear example of the effects of littoral zone exposure and severe drawdowns.

GLHA's *Common Loon Management Plan Assessment* met the SPD's goals and objectives [section 5.9(b)(1)]. The management area encompasses the Ripogenus impoundment, which is subjected to impoundment level fluctuations from project operation that can vary from year to year and are dependent upon the timing of the spring freshet, as well as the release of flows to meet downstream flow requirements. The assessment report also provided information on how the current loon management program at the project is being implemented. As noted above, information from this report will be used to assess and make recommendations for loon management at the Ripogenus Project over the term of a new license [section 5.9(b)(5)]. Thus, we do not recommend Mr. Spear's requested modifications to the approved *Common Loon Management Plan Assessment*.

**16. Recreation Study**

Background

The SPD required GLHA to conduct a *Recreation Study*, under which GLHA was to: (1) inventory and map existing Commission-approved project recreation sites, including locations, facilities and amenities, general site conditions, ownership, and management responsibilities; (2) evaluate recreation use at project recreation sites, including both an assessment of the amount of recreation use that each site receives and the recreation activities that occur at the site for both the summer and winter recreation seasons; (3) conduct user surveys at the project recreation sites, and online, to assess activities (including angling), site conditions, satisfaction with existing facilities, and recommendations regarding the sites and facilities; (4) conduct qualitative interviews or focus groups to obtain information on the informal and formal recreation sites; and (5)

assess the accessibility and useability of select project boat launching facilities provided at the project recreation sites (i.e., Chesuncook Dam Point Boat Launch, Caribou Lake Put-In, Millinocket Lake Boat Launch, Ambajejus Lake Boat Launch, and South Twin Lake Boat Launch) over the range of drawdown conditions experienced under existing project operations, and report on any changes that would be needed at the boat launching facilities to make them useable under the range of expected recreation season water levels.

Requested Study Modifications

In its comments, AW/AMC states that neither the user interviews nor the focus groups were conducted and were not reported as a variance from the approved *Recreation Study Plan*. AW/AMC also states that there are issues with access to certain informal recreation areas, such as trails leading to the water downstream from Ripogenus Dam, and requests that the *Recreation Study* include informal recreation access areas identified by stakeholders. Finally, AW/AMC indicates that a low number (34) of surveys were completed at the Penobscot Mills Project recreation sites and requests an additional study season to collect additional surveys.

The Camp Associations request that the *Recreation Study* include interviews with a variety of organizations, to possibly include the Camp Associations, commercial interests, and commercial river guides. The Camp Associations are also concerned about data discrepancies, which they state could be due to the use of the QR-code enabled Recreation Survey questionnaires, and request that alternative data, such as pictures and spot counts from people on site be accepted. Finally, the Camp Associations request that recreation use on Chesuncook, Caribou and Ripogenus Lakes be documented through the winter recreation season (January through March).

The Maine Bureau of Parks and Lands (Maine BPL) comments on the low number of surveys collected for the projects, and requests that: (1) GLHA conduct a fall and winter study during the second study season; and (2) in-person surveying replace or supplement the use of kiosks and online surveying to obtain more representative data. Maine BPL recommends that interviews or focus groups, as required in the SPD be part of the year two recreation studies. Finally, Maine BPL requests that the *Recreation Study* be modified to include an evaluation of recreation access to the West Branch downstream from Stone Dam, and a potential portage around Great Falls.

In his comments, Christopher Howe requests that the *Recreation Study* be amended to include all formal and informal access sites from Ripogenus Dam to the Grant Brook Road Bridge.[59] In its comments, Maine TU comments on the low numbers

[59] A distance of approximately 20 river miles downstream from the dam.

of completed survey forms for the projects and that there is a need for interviewers in the field. Maine TU also comments that the study needs to reflect the recreation season, which extends through September, and that the fishing survey numbers are inadequate to assess use. Finally, in its comments, the Maine Professional Rafting Outfitters (Maine PRO) recommends a *Recreation Access Study* only if the *Whitewater Study* is not amended.

Comments on Requested Study Modifications

In its reply comments, GLHA proposes to conduct a year two recreation study in 2023 to address stakeholder comments and to complete remaining tasks from the year one study. The study would include: (1) the completion of the planned inventory, use counts, and user surveys at the Green Bridge Boat Launch; (2) the completion of the inventory at the Dolby Pond and Dead Man's Curve Boat Launches; and (3) the collection of additional spot and calibration count data at the Dolby Pond and Dead Man's Curve Boat Launches. Also, GLHA would redeploy the user survey boxes at all project recreation sites in late July 2023 and leave them in place through March 2024. Further, GLHA proposes to convene a recreation focus group to: (1) review the information collected as part of the 2022 study; (2) obtain additional information on the project recreation sites; and (3) identify and evaluate key informal non-project recreation sites that provide important public access to project waters.

Discussion and Recommendation

GLHA's proposal to convene a focus group would provide a mechanism to collect additional information on formal and informal recreation sites at the projects [section 5.9(b)(4)]. While one focus group session would be helpful, we recommend that GLHA, as part of the 2023 *Recreation Study*, convene two focus group sessions, in order to both present data to the focus group participants and collect sufficient information from them [section 5.9(b)(6)]. The focus groups would be able to consider and comment on data discrepancies in the kiosk data. Addressing recreation access issues would be part of this process.

Regarding the requests for additional recreation surveys and in-person surveys, GLHA has redeployed their survey kiosks, allowing them to capture recreation data from the summer and winter recreation seasons. This should allow for more recreationists to be surveyed than in-person surveying, due to the remote and large nature of the projects [section 5.9(b)(7). Moreover, the combination of focus group sessions and the redeployment of the survey kiosks would provide for thorough locational and topical coverage of regarding recreation use input [section 5.9(b)(6)]. Because of the cost involved with in-person surveys at such remote and large-scale projects, the proposal for focus group sessions and the redeployment of the survey kiosks with more defined

instructions seems to be a reasonable compromise. Therefore, we do not recommend that the *Recreation Study* be modified to include additional in-person surveys.

**17. Whitewater Boating Assessment**

Background

The SPD required that GLHA conduct a *Whitewater Boating Assessment*, equivalent to a Whittaker Level 1 study,[60] using a combination of a literature review, a survey of whitewater boaters, and hydrologic analyses for four study reaches associated with the projects: (1) West Branch downstream from McKay Station to Debsconeag Falls; (2) West Branch downstream from Ripogenus Dam to McKay Station ("Upper Gorge" or "dryway"); (3) West Branch downstream from Stone Dam to Shad Pond; and (4) Millinocket Stream downstream from Millinocket Lake Storage Dam. The SPD also indicated that, depending on the findings of the first study season, a Level 2 or Level 3 study may be needed. GLHA conducted the *Whitewater Boating Assessment* on each of the four study reaches, in 2022.

Requested Study Modifications

TU comments that Level 2/3 studies may be needed in the Upper Gorge and that Level 2/3 studies are needed on the West Branch downstream from Stone Dam. Maine TU suggests that the studies be combined with wadability/fishability studies. Maine TU notes that access to the river on the West Branch downstream from Stone Dam is blocked by a locked gate and that boaters must paddle or row about 1 mile to reach Stone Dam.

In its comments, Maine BPL recommends a Level 2 or Level 3 study in the West Branch downstream from Stone Dam, conducted in consultation with American Whitewater and other paddling interests. Maine PRO recommends either amending the existing *Whitewater Study* (to evaluate the need for additional whitewater boating opportunities at the projects) or a *Supplemental Access Study* (to explore ways to improve and expand access to the West Branch and Millinocket Stream), but not to both. Cristopher Howe requested Level 2/3 whitewater boating studies for Millinocket Stream, the Upper Gorge, and the West Branch downstream from Stone Dam, as well as study of access issues to the West Branch downstream from Stone Dam. Finally, in its comments, AW/AMC requests that GLHA conduct Whittaker Level 2/3 studies, of the Upper Gorge

[60] Whittaker, *et al*. (2005) provides a generally accepted whitewater boating methodology that involves a phased approach consisting of three progressive levels: (1) a Level 1 desktop analysis; (2) a Level 2 on-land feasibility assessment and/or on-water single-flow feasibility assessment; and (3) a Level 3 intensive study, including multiple flows.

and West Branch downstream from Stone Dam reaches, and analyze how to improve access on these reaches, due to insufficient information gained from the Level 1 studies.

Comments on Requested Study Modifications

In its reply comments, GLHA states that it does not propose a Level 2/3 study of whitewater boating in either the Upper Gorge or the West Branch downstream from Stone Dam because there is sufficient information about the boatability of these two reaches to assess the effects of project operations and inform any need for license conditions.

Discussion and Recommendation

*Upper Gorge*

The Upper Gorge boating reach is a short, 0.75-mile-long section and boating within this reach is at an advanced or expert level with limited opportunity for egress or emergency rescue. Access to the put-in is gained by walking or driving across Ripogenus Dam. No commercially guided trips are offered on this section.

GLHA obtained ten interviews for this reach, which included experienced paddlers and professional guides [section 5.9(b)(6)]. Two of the interviewees self-reported paddling the reach hundreds of times and two other interviewees reported paddling the reach more than ten times. These interviewees shared their experiences with multiple flows and based on their experiences were able to provide context as to how these flows compared to one another. Eight of the ten interviewees reported that this reach of river provided a better whitewater experience than other reaches in the region. However, multiple interviewees noted that portaging would be very difficult and infeasible based on the steep-sided nature of the gorge.

The interviewees described flows in the 2,000-3,500 cfs range as 'really good' or 'just right.' Additionally, GLHA obtained and reviewed several videos documenting the entire reach at multiple flow conditions. These videos, in combination with the number and quality of interviews performed for this reach provide ample information regarding the suitability of various flows for whitewater boating [section 5.9(b)(7)]. The interviews and videos also make clear that the Upper Gorge provides a Class III-V boating experience at most flows, and that it is best suited for experienced, expert paddlers.

Based on the reach's existing information, short length (when compared to other nearby reaches on the West Branch), safety concerns, limited access, and remote setting, we do not recommend that GLHA conduct a Whittaker Level 2 or Level 3 Study for this reach.

*West Branch Below Stone Dam*

Currently, there is no formal put-in for this reach, and interviewees reported paddling across Quakish Lake for about 2 miles and portaging Stone Dam to gain access. Releases from Stone Dam are typically made by deflating the dam, which could provide an opportunity for whitewater recreation. GLHA obtained only two interviews for this reach.

A Whittaker Level 2 study would identify the reach's flow-dependent attributes, assess the feasibility and potential quality of boating opportunities there, and estimate flow ranges by boating the river. Due to the location of this reach near Millinocket and the lack of a sufficient number of interviews to determine potential boating opportunities, we recommend that GLHA: (1) proceed to a Whittaker Level 2 study for this reach; and (2) explore ways to increase access to this reach with stakeholders and study participants. This information should be included in an updated *Whitewater Boating Assessment Report* and filed with the USR. We are not recommending a Level 3 study for this reach due to the configuration of Stone Dam, which, having an inflatable, rubber dam, is not designed to provide consistent and predictable flow releases.

*Millinocket Stream*

GLHA completed 26 interviews for this reach and received general consensus that the minimum boatable flow is in the 400 to 500 cfs range, which is generally consistent with the findings on the whitewater boating study conducted during the previous relicensing [section 5.9(b)(4)]. The majority of interviewees reported an excellent experience boating this reach. Therefore, we do not recommend a Level 2/3 Study for this reach.

**18. Aesthetics Study**

Background

The SPD required GLHA to conduct a study of aesthetics at the projects. The first-year study, based on the Bureau of Land Management's Visual Resource Management methodology, documented the scenic views, vistas, riverscapes, and other noteworthy features of the Ripogenus and Penobscot Mills Projects from Key Observation Points (KOPs) where the projects are frequently viewed by the public. The first-year study was designed to augment and update existing information on the scenic and visual resources provided at the projects from various KOPs. GLHA identified KOP locations (which were described in the Revised Study Plan filed with the Commission on March 23, 2023) and conducted an initial field inventory and photo documentation of aesthetic resources from the KOP locations. The SPD also required the *Aesthetics Study* to be conducted in consultation with Maine BPL, AW/AMC, the Camp Associations, and

other interested stakeholders. The ISR indicated that this was not done in 2022. Instead, GLHA collected baseline photo documentation of noteworthy features and is now proposing to assemble a focus group to participate in supplementing the existing information on aesthetics at the projects.

Proposed Study Modifications

In its comments, AW/AMC and the Camp Associations request that GLHA complete the *Aesthetics Study* consistent with the methodology required by the SPD. Specifically, AW/AMC request that the study be conducted in consultation with Maine BPL, AW/AMC, the Camp Associations, and other interested stakeholders.

In its comments, Maine BPL requests that GLHA undertake an aesthetic evaluation of the views of the Upper Gorge from Ripogenus Dam and the Upper Gorge trail under various spill or scheduled whitewater flows, using the existing KOP evaluation form.

Comments on Requested Study Modifications

In its reply comments, GLHA proposed to convene a focus group of interested stakeholders to review the information gathered from the 2022 *Aesthetics Study* and identify potential additional KOPs for land and water that should be evaluated in the 2023 study.[61] GLHA proposes to work with the focus group to develop a plan to visit the selected KOPs for in-person evaluation. During this site visit, stakeholder focus group participants would evaluate the aesthetic value of the selected KOPs using the Bureau of Land Management (BLM) Visual Resource Management (VRM) methodology. The site visits would also be used to further discuss the aesthetics of project lands and waters. The results of this evaluation would supplement the existing aesthetics information provided in the *Aesthetics Study Report* filed with the ISR.

Discussion and Recommendation

GLHA's proposal would allow stakeholders to participate in identification of KOPs [section 5.9(b)(4)] and assigning weight to individual KOPs. Thus, we recommend that GLHA continue the *Aesthetics Study* with its proposed modifications, as the new proposal appears to capture the requested modifications and be consistent with the requirements of the SPD.

[61] GLHA anticipates holding the initial virtual focus group meeting in September, and the in-person meeting and site visit in October.

**20. Socioeconomics and Environmental Justice**

Background

In the SPD, staff stated that a description of socioeconomic conditions would be required in the final license application, and that information, along with the *Environmental Justice Study* results, would be sufficient to address existing information gaps regarding the effect of continuing to operate the Ripogenus Project and Penobscot Mills Project on socioeconomics and environmental justice communities. The SPD required that the *Environmental Justice Study* be conducted in consultation with the Penobscot Indian Nation and other relicensing stakeholders. In 2022, GLHA conducted an *Environmental Justice Study* to assess the projects' potential to impact minority and low-income populations in the project vicinity but the information in the ISR does not contain any consultation record with the Penobscot Indian Nation or other relicensing stakeholders. At the ISR Meeting, GLHA stated that it is approaching the study in two phases and that the second phase will include additional outreach, including with the Penobscot Indian Nation.

Requested Study Modifications

In its comments, Maine PRO expresses concern with the exclusion of the *Socioeconomic Study* proposed by the Penobscot Indian Nation and comments on the importance of preserving and enhancing outdoor industries.

In its comments, AW/AMC states that the 1-mile study area is overly narrow, and that the *Environmental Justice Study* should address project effects on the Penobscot Indian Nation, other indigenous groups, and individuals. AW/AMC also comments that the study failed to conduct outreach to the Penobscot Indian Nation or engage other stakeholder groups, and that project-related effects associated with current operation were not examined.

In its comments, Maine TU describes how the 1-mile study area is narrow and does not encompass the impacted communities. Maine TU requests a modified study with language clarifying the inclusion of the Penobscot Indian Nation. and the effects of mill closures on the tribe in terms of environmental justice.

Comments on Requested Study Modifications

In its third Study Progress Report,[62] GLHA indicates that it is the process of consulting with the Penobscot Indian Nation. GLHA also indicates that it is planning

[62] *See* GLHA's August 1, 2023, Filing.

additional outreach to members of identified Environmental Justice communities, and that data collected in 2023 will be provided in the USR.

Discussion and Recommendation

GLHA's *Environmental Justice Study* identified low-income environmental justice communities in five of the eight census block groups within the study area. However, the SPD required that the study be conducted in consultation with the Penobscot Indian Nation and other relicensing stakeholders. Therefore, the study must be conducted in consultation with the Penobscot Indian Nation and other relicensing stakeholders.

Regarding the scope of the study area, expanding the buffer may allow for more of the impacted communities to be included. Therefore, we recommend expanding the study to include a 5-mile buffer instead of the 1-mile buffer [section 5.9(b)(4)]. In addition, we recommend updating the analysis with the most current 2021 ACS data.

# APPENDIX C

## STAFF RECOMMENDATION ON REQUESTED NEW STUDIES

### McKay Station Fish Stranding Mitigation Study and McKay Station Ramping Rate Study

Background

The May 13, 2022, Study Plan Determination (SPD) required Great Lakes Hydro American (GLHA) to conduct a *Fish Stranding Study* in the West Branch of the Penobscot River (West Branch) downstream from McKay Station. The study was designed to evaluate the amount of stranding and mortality associated with a station trip[63] at McKay Station, when flows would drop quickly from generation releases (about 2,000 cubic feet per second; cfs) to 510 cfs.[64] The specific goals of the study were to assess the frequency and duration of unplanned outages at the Ripogenus Project, and to determine whether the outage flow strands fish in the West Branch of the Penobscot River (West Branch) between McKay Station and Nesowadnehunk Falls. The study area was divided into seven reaches within an approximately 5.2-mile stretch of river downstream from McKay Station.[65]

### McKay Station Fish Stranding Mitigation Study

Background (Cont.)

The *Fish Stranding Study*, which lasted about 4.5 hours (from 9:30 am to 2:00 pm), was conducted on October 5, 2022, by simulating an outage at McKay Station and observing the seven study reaches to document instances of fish or macroinvertebrate stranding. GLHA installed temporary staff gages in four of the study reaches (Holbrook

[63] Station trip, as defined herein, refers to an event where the generating units at the hydro station trip offline due to an unplanned outage.

[64] The SPD required that a minimum flow of 400 cfs be passed in simulating a station trip. However, due to the installation of a new breaker system for the generating units at McKay Station, the minimum flow now passed through the unit(s) during a station trip is 510 cfs.

[65] The areas included the Holbrook Side Channel (0.8 miles downstream), West Branch at the Holbrook Side Channel (0.8 miles downstream), West Branch at Telos Bridge (1.1 miles downstream), West Branch at Big Eddy (1.6 miles downstream), West Branch at Little Ambejackmockamus Falls (Little A Falls; 2.6 miles downstream) and Big Ambejackmockamus Falls (Big A Falls; 3.6 miles downstream), and West Branch at Nesowadnehunk Deadwater (5.2 miles downstream).

Side Channel, Telos Bridge, Little A Falls, and Nesowadnehunk Deadwater) to assess the effect of the simulated station trip on the duration and magnitude of changes to river levels.

During the simulated station trip event, fish and macroinvertebrate strandings in the designated study reaches were observed and recorded. Field teams were composed of two or more individuals, one of whom was a biologist or experienced angler. Study personnel waded and walked the perimeter of each study reach on foot, or navigated by boat, to document any stranded fish or macroinvertebrates observed. The field teams took photographs or videos of stranded fish and aquatic habitat during the simulated event. In addition, a drone was used at the Telos Bridge and Big Eddy reaches to provide wide-area coverage and observations in areas that were challenging to access by foot or boat. The drone provided geo-referenced high-resolution video and still photo images. Observations of each species at each site were categorized by relative abundance.

GLHA's *Fish Stranding Study* documented changes (drops) in water elevation at the time of the simulated station trip ranging from 1.4 feet at the Nesowadnehunk Deadwater site to 3.4 feet at the Telos Bridge site. Water levels in the Holbrook Side Channel were not affected by the drop in flow. The rate of change in water surface elevations and reductions in water depth was greatest at the upper sites in the study area (Telos Bridge, Big Eddy, Little A Falls, and Big A Falls). GLHA's report, as well as a fish stranding report of the same event filed by the Maine Council of Trout Unlimited (Maine TU) on October 19, 2022,[66] show that dropping flow at McKay Station from generation releases to 510 cfs resulted in fish and macroinvertebrate stranding and mortality, especially for juvenile landlocked salmon, blacknose dace, and brook trout.

Requested Study

During the Initial Study Report (ISR) Meeting, Commission staff observed that, while the methodologies and geographic scope of GLHA's and Maine TU's studies varied somewhat, the results of both studies show that stranding and mortality of aquatic organisms is occurring during unplanned outages at McKay Station. In our July 6, 2023, comments on the ISR, we noted that a next step would be to determine the frequency and significance of the fish stranding/mortality events, and if the events warrant mitigative measures.

[66] *See* https://elibrary.ferc.gov/eLibrary/filedownload?fileid=086DE661-0456-C845-A09B-83F0C9000000.

Comments on the Requested Study

In its comments, Maine TU states that the fish stranding studies show that station trip events result in "significant" stranding and mortality of fish and macroinvertebrates, and comments that if such flows occurred during the hot summer months or the cold winter months, additional mortality is expected. In its comments, the Maine Department of Fisheries & Wildlife (Maine DIFW) comments on the need to minimize low-flow events caused by unplanned outages at McKay Station. Neither Maine TU, nor Maine DIFW, however, requested specific modifications to the *Fish Stranding Study*.[67]

Discussion and Recommendation

GLHA's *Fish Stranding Study* documented fish and macroinvertebrates that were completely out of the water due to the rapid decrease in water levels, as well as fish and macroinvertebrates that were trapped in isolated pools or shallow, wetted areas. Areas of boulder and cobble bars, bedrock ledges, and fine substrates (e.g., sand and silt) were exposed through much of the area observed at the low flow of 510 cfs; though, much of the main river channel remained wetted. Juvenile landlocked Atlantic salmon and blacknose dace represented the majority of fish strandings; 55% and 31%, respectively, of the total 446 fish counted. Of the 247 juvenile salmon counted as stranded, 105 were observed to be dead (43%). For blacknose dace, 75% of the observed stranded fish were dead.

Given that this study occurred in October, it could represent a best-case scenario. It is reasonable to expect that the effect would likely be greater if the event were to occur in the (a) summer when air and water temperature are warmer and dissolved oxygen (DO) concentrations are lower, or (b) in the winter when the air and water temperature are colder. The observed level of mortality associated with station trips has a negative effect on landlocked salmon in the West Branch downstream from McKay Station [section 5.9(b)(5)].

The first study season findings of the *Fish Stranding Study* highlight the potential need to mitigate the fish and invertebrate stranding and mortality described above [section 5.15(e)(2)]. Therefore, we recommend that GLHA conduct a second study season *McKay Station Fish Stranding Mitigation Study* to identify and assess measures to minimize the level of fish and macroinvertebrate stranding and mortality that occurs when McKay Station trips offline. GLHA would consult with the U.S. Fish and Wildlife Service (FWS), Maine DIFW, and Maine TU to determine: (1) what effect the unplanned outages at McKay Station have on the fish and macroinvertebrate populations in the West

[67] Maine TU requested a *Ramping Rate Study* for the West Branch downstream from McKay Station, which also is discussed herein.

Branch downstream from McKay Station; and (2) if appropriate, identify potential ways to address fish and macroinvertebrate stranding and mortality downstream from McKay Station.[68] The results of this effort would be added to the first season findings in a final *Fish Stranding Study Report* provided with the Updated Study Report (USR).

**McKay Station Ramping Rate Study**

Requested Study

Also, based on the results of the *Fish Stranding Study*, Maine TU recommends that GLHA conduct a *McKay Station Ramping Rate Study* at, and downstream from, the Ripogenus Project to explore protocols for changing flows at McKay Station that could reduce or eliminate stranding and mortality of fish in the West Branch.[69] Maine TU's recommended study would follow the methodology used to determine ramping rates for the Magpie River in Quebec, Canada. The study would be conducted in early October; and whitewater flows of 2,000 to 2,400 cfs would be discharged for a week prior to the study commencing. Maine TU recommends the evaluation include a range of flows from the station's hydraulic capacity to 500 cfs (close to the station outage event flow). If stranding occurs at the initial ramping rate chosen for the study, the ramping protocol would be repeated on subsequent days at slower ramping rates until the safest ramping rate is identified. No other details regarding the study's methodology are provided by Maine TU.

Comments on the Requested Study

In their comments, the National Marine Fisheries Service and the Maine Department of Marine Resources recommend approval of Maine TU's request for a ramping rate study for the West Branch downstream from McKay Station. In its comments, Maine DIFW expresses concern with how Ripogenus Project operations may have changed since the Millinocket paper mills closed. Maine DIFW perceives that the

[68] Examples of measures that could be considered include: (1) a minimum flow that reduces the amount of stranding that is occurring; (2) a battery back-up system that supplies power to a unit or units at McKay Station when the main power source is unavailable, which would reduce the amount of time at the low flow; (3) automating a gate at Ripogenus Dam so that when McKay Station trips offline a gate opens to release a preset minimum flow to the West Branch downstream from Ripogenus Dam; etc.

[69] Though both the first season *Fish Stranding Study* and the recommended second season *McKay Station Ramping Rate Study* are concerned with stranding and mortality of aquatic organisms downstream of McKay Station, the studies differ in that the former addresses system shutdowns and the latter addresses normal changes in turbine operations.

frequency and rate of change in discharge to the West Branch downstream from McKay Station may have increased in the modern, "post-mill" era.

Reply Comments

In its reply comments, GLHA proposes to conduct a *McKay Station Ramping Rate Study* at the Ripogenus Project. The study would evaluate two change-in-flow scenarios. The first scenario would entail going from 3-unit operation (~3,500 cfs) to 1-unit operation (~1,100 cfs) by simultaneously shutting down two units.[70] The second scenario would entail going from 3-unit operation (~3,500 cfs) to 2-unit operation (~2,300 cfs) to 1-unit operation (~1,100 cfs); holding at 2-unit operation for an hour before going to 1-unit operation. In addition, the study would include a review of the "post-mill" operational data (2014 through 2022) to identify the frequency of hourly changes in operations when changing from three units to two units, three units to one unit, and two units to one unit.

The study area for the *McKay Station Ramping Rate Study* would include the West Branch between McKay Station and Little A Falls. Within the study area, GLHA would focus on three of the seven study reaches that were part of the *Fish Stranding Study*: (1) the main stem of the West Branch (upstream of the Holbrook Side Channel); (2) riffle habitat immediately downstream from the Big Eddy pool; and (3) riffle habitat in the upper section of Little A Falls. The study would be conducted in the fall (prior to October 15, 2023), and GLHA would conduct the field study evaluation immediately after whitewater flows, ranging from 2,000 cfs to 2,400 cfs, have occurred for at least 1 week, if possible.

Field crews[71] would observe and measure changes in river conditions and aquatic habitat within the three study reaches during changes in unit operations for the two scenarios. Changes in river stage within the study reaches would be measured with water level loggers programmed to collect data at 5-minute intervals. Changes in wetted width also would be collected at two to four cross sections within each of the three study reaches using a range finder or comparable method. The data collected would be used to evaluate the effects of the rate of change of flow on water depth and wetted area habitat

[70] Based on historical operations (see hourly operations data filed with the Initial Study Report Meeting Summary), the units vibrate significantly at gate positions less than 70% to 80% of maximum hydraulic capacity, depending on reservoir level. Therefore, under typical project operations, compared to an extended ramping of the units during startup or shutdown, the units are operated to rapidly move through the vibration zones to avoid damage to the units.

[71] Field crews would consist of representatives of GLHA, Maine DIFW, and Maine TU.

conditions, as well as to compare the differences in flow rate change effects on habitat conditions under the two scenarios to determine if there would be a beneficial "ramping" rate effect associate with the three-to-two-to-one unit operation scenario.

Field crews also would perform reconnaissance surveys in the three study reaches, employing methodology like that used for the *Fish Stranding Study*, to determine the extent to which fish and macroinvertebrate stranding occur under different in ramping operations.

Discussion and Recommendation

The *Fish Stranding Study* documented that fish and macroinvertebrate stranding occurs with an abrupt change in flows from 2,000 cfs to 500 cfs (i.e., station trip event) [section 5.15(e)(4) and sections 5.9(b)(4)]. Juvenile landlocked salmon are particularly susceptible to such abrupt flow changes. However, neither the *Fish Stranding Study*, nor any other study required by the SPD, provide information on flow levels or alternative means of project operations (e.g., ramping) to prevent mortality of aquatic organisms resulting from rapid flow changes [section 5.9(b)(4)]. Thus, the results of a ramping rate study would provide information important to evaluating the effects of changes in unit operations on aquatic resources and habitat across the range of project discharges and could inform the development of license conditions [section 5.9(b)(6)]. For these reasons, we recommend: (1) GLHA conduct its proposed *McKay Station Ramping Rate Study*, after consulting on final details of the study and its implementation with Maine DIFW and Maine TU; and (2) the *McKay Station Ramping Rate Study Report* be filed with the USR

Regarding Maine TU's request to evaluate a flow of 500 cfs, there is no need to include such a low flow as part of the ramping rate study. The discharge only drops that low when there is a system trip, the effects of which were documented in the first season *Fish Standing Study*. Above, we have also recommended a *McKay Station Fish Stranding Mitigation Study* in a second season to supplement the *Fish Stranding Study Report* with potential strategies to reduce effects of system trips, if feasible.

**Smelt Study**

Background

The SPD included a *Fish Assemblage Study* of the Ripogenus impoundment and the West Branch downstream from Ripogenus Dam. GLHA conducted the study and documented the presence of smelt in the Ripogenus Impoundment, as well as the occurrence of smelt "drift" through McKay Station downstream to the West Branch.

Requested Study

Edward Spear states that the smelt information included in the ISR shows a population of larger-sized smelt that are too big to serve as prey for adult landlocked salmon. Mr. Spear claims that, in addition to cannibalism; reduced abundance of zooplankton; reduced, fluctuating, or lost littoral areas; a reduced volume of water between surface- and deep-water layers in the impoundment (or metalimnion); and turbidity are known factors affecting smelt populations. Mr. Spear recommends that GLHA conduct a smelt study of the Ripogenus impoundment that focuses on spawning, egg survival, fry escapement, zooplankton availability (with an emphasis on rotifers), and survival of smelt through their first year. The goal of this study would be to assess the status of the Ripogenus smelt population by following an age class from egg to Age 1, as well as to determine the contribution, if any, of this cohort to the prey base in the West Branch downstream from McKay Station and the salmonid fishery.

Mr. Spear recommends that the study involve documenting smelt spawning escapement in a Ripogenus impoundment tributary (e.g., Ragged Stream). Spawning success would be measured following methods described in a Maine DIFW report, "Developing Catch Indices for Rainbow Smelt Fry Outmigration on North Brook, Lily Bay Moosehead Lake." The distribution and timing of larval juvenile smelt outmigration would be determined using: (1) bi-weekly (vertical) plankton tows; and (2) horizontal larval smelt sampling with oblique plankton trawls, beginning in the shoreline littoral area and continuing into the pelagic (open water) zone. Lake sampling would extend from the spring into October. Smelt "drift" through McKay Station would also be sampled, but appropriate methods have not been described.

Reply Comments

In its reply comments, GLHA does not propose the smelt study requested by Mr. Spear.

Discussion and Recommendation

Edward Spear, in a letter filed on January 27, 2022, requested a study to determine the status of the zooplankton population in the Ripogenus impoundment, and its relationship to larval and juvenile smelt. In requesting the study, Mr. Spear cited to the current quality of the landlocked Atlantic salmon fishery in the Ripogenus impoundment, which he argued at the time was in decline. Mr. Spear provides similar reasoning on the need here for the smelt study, with little additional support or explanation as to how such a study would inform a licensing decision [sections 5.9(b)(4) and (b)(5)].

The results of the *Fish Assemblage Study*, as presented in section 5.0, *Results*, of Appendix D to the ISR, along with Great Northern Paper's historical sampling data and

Maine DIFW's past and on-going smelt "drift" studies are sufficient for an analysis of the effects of project operation on the smelt population in the Ripogenus impoundment and the amount of smelt drift downstream into the West Branch [section 5.9(b)(5)]. There has been no material change(s) in the law or regulations applicable to the information request [section 5.15(e)(1)], nor has there been a significant change in the project proposal or significant new information material to the study objectives that has become available [section 5.15(e)(4)]. Based on these factors, coupled with the adequacy of the information in the record, we do not recommend that GLHA conduct the *Smelt Study*.

**West Branch Creel Survey**

Background

In his comments on the Proposed Study Plan, Edward Spear requested that GLHA conduct a creel survey on the West Branch employing the methods used in the 1978 creel surveys that were conducted in support of the previous relicensing. The SPD did not approve Mr. Spear's requested Creel Survey. Instead, staff stated that during the ILP's study period, Maine DIFW would conduct periodic creel surveys on the West Branch, which GLHA would then compile and synthesize. Further, the SPD required GLHA to modify the *Recreation Study*, to include questions about fishing activities on the survey of recreation users. GLHA added these questions to the Recreation Survey.

Requested Study

In their comments, Maine TU and Mr. Edward Spear request that GLHA be required to fund a Maine DIFW-designed, managed, and staffed creel survey of the West Branch between Ripogenus Dam and Abol Bridge.

Comments on the Requested Study

In its comments, Maine DIFW provides its rationale for not requesting clerk angler surveys as part of the relicensing.[72] The reasons include: (1) the need for consistency and repeatability in survey methodology; (2) the availability of ample, recent angler survey data from summer and winter 2021 collected by Maine DIFW; (3) the fact that Maine DIFW has the information currently needed to assess the fishery and respond with management changes, as necessary; and (4) plans by Maine DIFW to survey the Ripogenus Project and the West Branch in 2025.

[72] In creel surveys, a clerk is the person that administers the survey.

Reply Comments

In its reply comments, GLHA states that it included creel survey information collected by Maine DIFW in 2021 and 2022 for the West Branch downstream from McKay Station in the *Fish Assemblage Study Report*. Also, in the ISR, GLHA included responses to the fishing-related questions that were added to the recreational survey questionnaire.[73] In response to GLHA's reply comments, Mr. Spear discusses additional issues from the first year study efforts and results and states that, despite existing information, there is still a need for West Branch creel surveys to define recreational angler use (days fished), effort (hours fished), catch (legal and sub-legal salmon and brook trout catches), and river reach fished.

Discussion and Recommendation

Several commenters noted the low number of surveys and near absence of data on winter use from the first-year study. To collect additional recreational user surveys, GLHA reinstalled survey kiosks in July 2023, which will be available through March 2024 to obtain more data on the recreational fishery. This approach would require less effort than conducting a separate creel survey [section 5.9(b)(7)] and would assist in more accurately describing the fishery in the environmental document for the projects. Moreover, Maine DIFW's existing data, as well as information from the upcoming 2025 surveys, along with GLHA's survey efforts would provide sufficient information to inform a licensing decision [section 5.9(b)(5)]. For these reasons, we do not recommend that GLHA conduct the *Creel Survey*.

**USGS Gage Feasibility Study**

Background

There are no streamflow gages installed on the West Branch to determine flow in the river. Rather, GLHA currently determines flows in the river, throughout the Ripogenus and Penobscot Mills Project areas using generation records from the projects.

[73] Survey respondents were asked to provide information on the species targeted, length of time fishing, species caught, and the size of fish caught. For the Ripogenus Project recreation sites, 48 respondents answered the question of what species of fish were targeted. Respondents indicated that they were targeting 11 different species, including landlocked salmon, brook trout, white perch, lake trout, brown trout, yellow perch, splake, cusk, chub, lake whitefish, and white sucker. The dominant species caught were landlocked salmon, brook trout, white perch, and chub. The average and median amount of time respondents spent fishing were 7.8 hours and 4 hours, respectively, with a range of 0.5 to 72 hours.

Requested Study

Maine DIFW recommends that GLHA work with the U.S. Geological Survey (USGS) to determine the feasibility and cost for a new USGS gage on the West Branch at a location downstream from McKay Station and upstream of the Big Eddy Campground.

Comments on the Requested Study

In its reply comments, GLHA does not propose the *USGS Gage Feasibility Study* requested by Maine DIFW.

Discussion and Recommendation

The Preliminary Application Document indicates, in section 4.0, *Outflow Records*, on page 4-51, that there are no flow gages immediately upstream of, within, or immediately downstream from, the Ripogenus and the Penobscot Mills Projects. The lack of streamflow gaging has raised concerns regarding flow monitoring at the projects, especially the Ripogenus Project, and the need for streamflow gaging was raised at the ISR meeting and in comments on the ISR. Given these concerns, we intend to evaluate alternatives for streamflow monitoring as part of our environmental review of the proposed projects. Having information on alternatives for monitoring streamflow, including the feasibility and costs of the alternatives, would be necessary for our analysis. Maine DIFW's requested study would provide information on the feasibility and cost of installing a USGS streamflow gage(s) that would be connected to the internet, on the West Branch [section 5.9(b)(4)]. For these reasons, we recommend that GLHA evaluate alternatives for monitoring streamflow at the projects, including the installation of a USGS streamflow gage on the West Branch downstream from McKay Station. We also recommend that the specific study details be development in consultation with USGS and Maine DIFW, and the resulting report be filed with the USR.

**Penobscot Mills Bypass Channel Fishability/Wadability Study**

Background

Under the current license, minimum flows are not required in the West Branch of the Penobscot River downstream from Stone Dam (which is part of the Millinocket Development). This reach is about 4.5 miles long and flows into Shad Pond. The results of the *Instream Flow and Habitat Assessment Study for the West Branch of the Penobscot River downstream from Stone Dam* show that a flow of about 700 cfs appears to be optimal for landlocked Atlantic salmon. However, flows that may be optimal for fish are not always optimal for wading anglers. Anticipating a potential future minimum flow release requirement for Stone Dam, Maine DIFW plans to assess the viability of a limited salmonid stocking program for this stretch of the West Branch of the Penobscot River.

Maine DIFW states that, given the rugged nature of this reach, lack of previous flow data, and site-specific information, a fishability/wadability study is necessary to evaluate safe angler access to, and within, this reach.

Requested Study

Maine DIFW requests that GLHA conduct a fishability/wadability study in the West Branch downstream from Stone Dam. The goal of this study would be to identify the range of flows that allow for safe wading and fishability. Maine DIFW states that the study is needed to ensure that any agreed upon flow releases for salmonid habitat are wadable and fishable. Maine DIFW also states that the study would be a collaborative effort (selecting survey locations and test flows, etc.) between Maine DIFW, GLHA, and other interested stakeholders. Maine DIFW's recommended study would consist of anglers assessing river wading conditions and fishability across an agreed-upon range of flows[74] at locations within the West Branch of the Penobscot River downstream from Stone Dam.

Comments on the Requested Study

In its comments, Maine TU supports a wadability study in the river reach downstream from Stone Dam to determine how best to optimize the area for fishing, as well as additional whitewater boating opportunities. In his comments, Edward Spear requests adding a component that would address wading in the reach, or "how anglers would move up and down this river segment to reach the fish."

Reply Comments

In its reply comments, GLHA proposes to conduct a *Penobscot Mills Bypass Channel Fishability/Wadability Study*. As with Maine DIFW, the goal of the study would be to evaluate conditions that allow safe wading and fishability under a range of flows suitable for improving salmonid habitat. The study area would be the West Branch between Stone Dam and Grand Falls.[75] As described in detail in Appendix D of its August 7, 2023, reply comments, GLHA's proposed methodology involves a phased approach that includes an angler assessment component and use of the existing Instream

[74] The actual test flows would be selected through a collaborative process involving Maine DIFW, GLHA, and other interested stakeholders (e.g., area guides, local anglers, and Maine TU).

[75] Inflow from Quakish Lake enters the study area over the spillway at Stone Dam whenever inflow exceeds the hydraulic capacity of operating units at the Millinocket Development and/or wind fetch and waves introduce uncontrolled spillage.

Flow Incremental Methodology model to simulate conditions that affect wading conditions and fishability in the reach.

GLHA proposes to assemble a study team of about 10 experienced anglers familiar with this type of fishing, potentially composed of Maine DIFW personnel, area guides, local anglers, Maine TU, and other interested stakeholders. The angling team would conduct a site visit to the study area for orientation and to provide input on preferred angling sites. The initial site visit would also be used to evaluate wading conditions and fishability at existing leakage flow (estimated to vary between 17 cfs and 100 cfs). Each angler would be encouraged to wade, cast, and otherwise fish the water, and would be provided with a questionnaire soliciting rating input on the parameters above (*see*, e.g., Attachment 1 of Appendix D to GLHA's reply comments). The goal of this exercise is to generate site-specific input on suitable wading depths and ability to cast to fish holding areas. This effort would be followed by a discussion to determine if it would be feasible, or necessary, to reconvene the angling team on another day when GLHA would attempt to provide a higher flow in the range of 400-700 cfs. Flow would be measured throughout the day, during this event, and the angling team would repeat their field evaluation of angling conditions at that flow.

GLHA would apply the existing Physical Habitat Simulation (PHABSIM) model to evaluate angling suitability at flow increments not feasible to evaluate empirically. GLHA would use the 3-D spatial analysis heat map tool within PHABSIM to show specific patches of highly suitable brook trout habitat at each designated flow of interest. Patches of habitat that were considered as good to optimal would be identified and highlighted. These areas would have a high probability of holding adult brook trout at the evaluated flow, and, thus, would be considered as 'fish lies,' or desirable angling areas.[76] The casting distance relative to the desirable fish lie would be calculated to determine fishability at each flow, and from this the relative fishability of each flow of interest would be determined.

Discussion and Recommendation

The *Instream Flow and Habitat Assessment Study for the West Branch of the Penobscot River downstream from Stone Dam Study* shows that a flow of 300 to 400 cfs would increase wetted area and substantially improve the availability and suitability of habitat for brook trout (juveniles and adults), land-locked salmon juveniles, and

[76] The exact range of suitability to be considered fish lies would be developed in consultation with Maine DIFW brook trout experts.

macroinvertebrates in the reach.[77] The model estimated that habitat suitability for juvenile and adult brook trout, as well as juvenile land-locked salmon would increase with flow up to 500 cfs (juvenile trout and salmon) and 700 cfs (adult trout), before declining at higher flows. Habitat suitability for land-locked salmon adults would increase with flow up to the maximum flow of 2,000 cfs, and habitat for macroinvertebrates would increase with flow up to 1,000 cfs before declining. According to the study report, the predominate substrate in this reach is boulder (above Great Falls) and boulder and bedrock ledge in the lower reach (below Great Falls). Thus, flows necessary to establish suitable aquatic habitat for salmonids in the reach may create unsafe conditions for wading and fishing in the reach (i.e., the ability for anglers to safely wade and fish).

The SPD required GLHA to assess flows and aquatic habitat needs in the West Branch downstream from Stone Dam but did not require GLHA to assess the wading conditions and fishability of the range of flows studied [section 5.9(b)(4)]. Such an evaluation is necessary to determine suitable and safe wading and fishing flows, while also maintaining adequate salmonid habitat in the river reach [section 5.9(b)(5)]. However, the study, as requested by Maine DIFW may not work at Stone Dam. Maine DIFW's requested study envisions a visual assessment at different flows. As noted by GLHA, however, Stone Dam is not equipped with gates that can be opened to provide specific flows. Moreover, the approximate 4-mile length of the study reach could require a day for conditions to stabilize at each potential assessment flow. GLHA's proposed study methodology is a reasonable alternative to Maine DIFW's recommended methodology that would require a multi-day effort [section 5.9(b)(6)] and is sufficient to evaluate wading conditions and fishability at different flows in the West Branch downstream from Stone Dam [section 5.9(b)(5)].

In our comments on the ISR, we requested that GLHA: (1) address the suitability of the reach for angling under the range of flows studied; and (2) identify the flow (or flow range) where the reach is no longer suitable for wading, in the *final Instream Flow and Habitat Assessment Study (Stone Dam) Report*. Consistent with our comments, we recommend GLHA conduct its proposed *Penobscot Mills Bypass Channel Fishability/ Wadability Study*, which would make use of the PHABSIM model at higher flows. We also recommend the study be designed to: (1) address the suitability of the reach for angling under the range of flows studied for brook trout and landlocked salmon; and

[77] The actual suitability of habitat gained with increased flow, however, would be limited by water temperatures in the reach during the summer months. Water temperatures in 2022 averaged about 23 °C (73 °F), with a range from around 18 to 28 °C (64 to 82 °F). These temperatures would be more conducive to the year-round survival of land-locked Atlantic salmon than to brook trout. *See* GLHA's *Downstream Water Temperature and Dissolved Oxygen Study Report*.

(2) because the proposed study plan is not clear on how flows would be rated as to their suitability for angling, identify the flows at which conditions are and are not suitable for wading and fishing. The results would be included in the final *Instream Flow and Habitat Assessment Study (Stone Dam) Report*. We also recommend that the study be designed and implemented in consultation with Maine DIFW, FWS, the Maine Department of Environmental Protection, Maine TU, and any other interested entity.

**Umbazooksus Lake Mitigation Evaluation Study**

Background

The SPD required GLHA to conduct a *Riparian and Littoral Habitat Assessment Study* for the Ripogenus Project and the Penobscot Mills Project. The goals of the study were to: (1) identify and characterize riparian and littoral habitat and quantify the exposed area within the historical fluctuation zones of the projects' storage impoundments (i.e., Ripogenus, North Twin, and Millinocket Lake Storage); (2) identify and characterize the existing wetlands within 200 feet of the three storage impoundments' normal full pond elevations; and (3) document observations of wildlife and invasive aquatic plant species within the projects' boundaries. The *Riparian and Littoral Habitat Assessment Study Report* provides information on: (1) impoundment water surface elevations and an assessment of exposed areas during drawdowns; (2) an assessment of wetland, riparian, and littoral habitat, including wetland mapping and characterization of the vegetation communities; (3) aquatic invasive plant species within the projects' boundaries; and (4) observed wildlife in the study areas. As pointed out by Maine DIFW, the effects of project operations on: (1) the downstream West Branch from the Ripogenus Project to the Penobscot Mills Project; (2) the West Branch downstream from Stone Dam; (3) Millinocket Stream; and (4) associated riverine wetland habitats was not considered as part of the *Riparian and Littoral Habitat Assessment Study*.[78]

Requested Study

In its comments, Maine DIFW states that it is concerned with the effects of project operation on riparian and littoral habitat along the flowing reaches of the West Branch and Millinocket Stream, and the species that occupy these areas. Maine DIFW states that its goal in this process is to consider ways to minimize and mitigate effects on lacustrine, palustrine, and riverine habitats and the species that use those habitats, including State

[78] Maine DIFW indicates that many State Species of Greatest Conservation Need, including state threatened aquatic or aquatic-associated invertebrate species in the project areas, require specialized experience, specific survey protocols, and proper seasonality to detect, and most of these species, if present, would not be documented through general wildlife surveys, as was done during the 2022 wildlife surveys.

Species of Greatest Conservation Need. To address these needs, Maine DIFW is interested in exploring whether the existing Umbazooksus Lake wetlands mitigation area, alone, is adequate to account for potential future effects of the projects' operations on riparian resources.

Maine DIFW requests a study to evaluate the Umbazooksus Lake wetlands mitigation area to determine whether it can be further enhanced as part of a new Ripogenus Project license. Maine DIFW proposes a Geographic Information System (GIS)-based study to evaluate wetlands at Umbazooksus Lake, with an increase in water levels at 1-foot increments, up to 4 feet, using the existing regime as the baseline. Maine DIFW requests that the study include: (1) the acreages and composition of modeled wetland types released at each level evaluated; (2) available aerial imagery or existing photographs; and (3) a narrative of wildlife resources expected to use each wetland type.

Comments on the Requested Study

In its reply comments, GLHA proposes to conduct Maine DIFW's requested *Umbazooksus Lake Mitigation Evaluation Study*, with modifications. The objectives of the proposed new study would be to: (1) perform a desktop characterization using FWS (2022) National Wetlands Inventory and other resources such as GIS-based topographic maps, hydrography, aerial imagery, and soil surveys to identify, describe, and classify wetlands and waterbodies (e.g., streams) within the study area (including littoral and riparian zones); (2) perform field verification surveys to confirm the location, dominant vegetative communities, and vegetation classifications identified in the desktop survey; (3) identify the dominant wetland vegetation in the study area to characterize the availability of wetland habitat; (4) document invasive plant species observed; (5) describe principal wetland functions and values; (6) document wildlife sightings during field surveys; and (7) develop a GIS-based map identifying wetlands and riparian and littoral vegetative community composition.

GLHA notes that the current mitigation and management strategy for Umbazooksus Lake consists of permanently opening the discharge gate to lower water levels and increase the wetland habitat at the lake. GLHA states that if the water surface elevation of Umbazooksus Lake was raised, it would decrease wetland habitat. Therefore, GLHA has not adopted Maine DIFW's request to evaluate the change in habitat resulting from a potential increase in the water surface elevation at Umbazooksus Lake.

Reply Comments

In comments filed on August 25, 2023, Maine DIFW states that GLHA did not provide information to support its claim that by raising the water level in the lake it would decrease the total acres of wetlands. Based on a preliminary analysis of aerial

imagery, Maine DIFW asserts that there would be, at a minimum, an increase in the level of interspersion in these areas, if not an increase in the total acres of wetlands. Maine DIFW also asserts that by increasing the interspersion of the fringe wetlands, wetland functions would improve, and acreage would increase. Maine DIFW states that these are important wetland types that are characteristic of high-quality wetlands and would support a diversity of wildlife, including waterfowl, wading birds, and aquatic furbearers.

In comments filed on August 30, 2023, GLHA states that the objective of the 1997 Wetland Enhancement Plan for Umbazooksus Lake was to increase the extent, density, and species diversity of wetland vegetation cover within the zone from the former full pond elevation down to about 6 feet below ordinary low water by: (1) lowering the average water level of the lake; (2) establishing a more consistent hydrologic regime from year-to-year; and (3) reducing the variability of water levels during the growing season. GLHA states that the wetlands at Umbazooksus Lake prior to implementation of the 1997 plan were limited to fringe emergent and shrub wetland types around the lake's shoreline. GLHA states that lowered lake levels were agreed to, based on extensive consultation with the agencies, to enhance the fringe wetland types that existed at the time and to establish new emergent and aquatic bed wetlands within the lake.

GLHA states that Maine DIFW's request to evaluate higher water levels at Umbazooksus Lake conflicts with the original intent and design of this mitigation measure. GLHA points out that monitoring has verified the intended results. GLHA proposes to collect contemporary data at Umbazooksus Lake to evaluate the current conditions in relation to the intended mitigation measure and the current relicensing of the projects.

Discussion and Recommendation

During the previous relicensing, the Commission determined that the ongoing operation of the projects resulted in diminished function of shoreline fringe wetlands due to dewatering during impoundment drawdowns.[79] The existing Ripogenus Project license required the development of the 1997 Wetland Enhancement Plan. The approved plan established the Umbazooksus Lake Mitigation Area. As noted above, the goal of plan was to increase the extent, density, and species diversity of wetland vegetation in Umbazooksus Lake, as well as establish a more consistent hydrologic regime and reduced the variability of water levels during the growing season. The 2005 Umbazooksus Lake Wetland Enhancement Final Report demonstrated that 320 acres of degraded wetland habitat were starting to recover by discontinuing the historic storage

[79] *See* Section 4.5 of Commission's 1996 Final Environmental Impact Statement for the Upper Penobscot River Basin, Maine FERC Project Nos: 2572 and 2548 (Volume 1).

and release operation. This was achieved by maintaining the outlet gate in a permanently open position and allowing water levels in the lake to fluctuate naturally from the inflow from the surrounding watershed and uncontrolled outflow through the gate. The total extent of vegetated wetlands surrounding Umbazooksus Lake increased by approximately 117 acres from 1998 to 2004. Overall, vegetative cover (i.e., density) increased over 350% in the areas formerly affected by project operation.

GLHA proposes to use available information, as well as information collected during studies in 2022 and 2023 to evaluate effects on riverine wetland habitats from project operations. However, Maine DIFW's proposed GIS-based study to evaluate wetlands at the Umbazooksus Lake mitigation area, including evaluating incremental increases in water levels in Umbazooksus Lake, would provide a quantitative means for Maine DIFW and GLHA to predict if the Umbazooksus Lake Mitigation Area can be further enhanced and to assess appropriate measures to address the effects of operating the projects on the downstream West Branch and its associated riverine wetland habitats [sections 5.9(b)(5) and 5.9(b)(6)].

GLHA states that Maine DIFW's request to evaluate higher water levels within Umbazooksus Lake conflicts with the original intent and design of 1997 Wetland Enhancement Plan. The 2005 final monitoring report indicates that there was a conversion of many areas from emergent to scrub-shrub emergent cover. A total of 320 acres of degraded wetlands associated with the former store-and-release operations showed signs of recovery, and the total extent of vegetated wetlands surrounding the lake increased by 117 acres after lowering the lake level. However, the plan estimated that an additional 280 acres of new shallows (i.e., area less than 6 feet in depth) would be created that had the potential to support the establishment of emergent and aquatic wetlands. Thus, the increase of 117 acres of new wetlands falls short of the 280-acre target. This suggests that there could be potential for further enhancement of wetlands around Umbazooksus Lake [section 5.9(b)(4)].

Based on the 2005 Umbazooksus Lake Wetland Enhancement Final Report, opening the outlet gate at Umbazooksus Lake, which can impound up to 6.5 feet of water behind the dam, lowered the level of the lake and allowed wetland habitat around the lake to recover. A study that includes a GIS-based assessment would help verify whether increasing the Umbazooksus Lake level would increase or decrease wetland habitat. Maine DIFW states that in its preliminary GIS-based assessment of increasing water levels at Umbazooksus Lake indicates that wetlands around the lake, as well as the function and diversity of the wetlands, could increase, whereas GLHA states that higher levels would conflict with the wetland enhancement plan currently being implemented. A study would help determine the best course of action.

Because riverine wetland habitats were not considered as part of the *Riparian and Littoral Habitat Assessment Study* [section 5.15(e)(2)] and for the reasons discussed

above, we recommend that GLHA conduct its proposed *Umbazooksus Lake Mitigation Evaluation Study* with modifications to include: (1) the GIS-based evaluation of wetland habitat requested by Maine DIFW, with increases in water surface elevations in the lake at 1-foot increments, up to 4 feet (existing regime would be the baseline); and (2) a description of wildlife resources expected to use each wetland type to supplement the data collected on species observed during the field surveys.

**Winter Recreation Access Study**

Background

The SPD required GLHA to evaluate recreation use during both the summer and winter recreation seasons as part of its *Recreation Study*. Thin ice conditions in winter 2022-2023 likely under-represented use.

Requested Study

In its comments, Maine DIFW requests an updated evaluation of winter angling access at the Ripogenus impoundment in the form of a *Winter Recreation Access Study*. Maine DIFW states that winter angling and snowmobile access is limited at the Chesuncook Point access site, which is the primary access site to the Ripogenus impoundment in the winter. Maine DIFW also states that it is important to maintain and promote winter angling and access on the impoundment. It is currently Maine DIFW's goal to increase harvest of salmon in the impoundment, and most of the annual salmon harvest occurs in the winter months.

In addition to its responsibilities regarding inland fisheries management, Maine DIFW indicates that it is charged with improving and securing public access to waters of the State of Maine. Maine DIFW requests the *Winter Recreation Access Study* because of concerns that use was under-represented in data collected this past winter as the ice formed very late, making it unsafe for travel and use through all of January. As a result, winter use was reduced in 2023 and, therefore, atypical during GLHA's *Recreation Study* period. Maine DIFW describes how its requested study should collect information on all recreation access points, including evaluating the capacity at the Chesuncook Point access site parking area and ease of access/conditions from the Golden Road, and determine overall use by area and by type. Maine DIFW recommends that the methodology include site visits on each Saturday between 10:00 am and 1:00 pm from January 15 through March 31.

Comments on the Requested Study

In its reply comments, GLHA indicates that it plans to convene a recreation and access focus group to obtain additional site-specific recreation and informal access

information, as well as concerns from interested stakeholders. Additionally, GLHA states that it redeployed the user survey kiosks at all project recreation sites in late July 2023 and plans to leave them in place through March 2024.

Discussion and Recommendation

Through GLHA's proposal to establish a recreation focus group, additional information on the project recreation sites would be collected, as well as information on informal, non-project recreation sites that provide important public access to project waters [sections 5.9(b)(4) and (b)(6)]. The information gathered would apply to all seasons, including winter. In addition, GLHA would be collecting winter use and access information through the redeployment of the survey kiosks at the project recreation sites, which would provide needed winter recreation use data. For these reasons, the effort of this separate survey would not provide additional insight into winter access and use at the Ripogenus Project [section 5.9(b)(7)]. Therefore, we do not recommend GLHA conduct the *Winter Recreation Access Study* requested by Maine DIFW.

## APPENDIX D

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Kimberly D. Bose, September 26, 2023
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Dear Secretary Bose, Via Electronic filing

Project Nos. 2572-133 & 2458-247, Determina. on on Requests for Study Modifications and New Studies for the Ripogenus and Penobscot Mills Hydroelectric Projects. 7. North Twin Impoundment Tributary Access Survey Study.

The above reference filing continues to reject MeDIFW logical and reasonable request for radio tagging of North Twin Impoundment adult Landlocked salmon, and to accept the Licensee's ill-founded logic while ignoring basic scientific facts. As proposed, the current study duplicates information found in the 1992 Application, albeit with "bells and whistles", i.e., photos and transects. The rocks, boulders, and tributary channels have not changed. Without radio telemetry, no new information will be provided.

,

FERC staff filing failed to discuss telemetry study requests; rather they referenced their decision made in a May 13, 2022 filing. (Study Plan Determination for the Ripogenus Hydroelectric Project and the Penobscot Mills Hydroelectric Project May 13, 2022 Study Plan Determination.) In summarily dismissing MeDIFW's request in the May 13, 2022 filing, they state "*radio telemetry study could track movement of salmon and potentially detect spawning behavior in these areas. However, such a study would have a significantly higher cost than that proposed by GLHA"* B17. This statement in not based on any cost information, and thus irrelevant. Surely the Licensee's consultants and/or MeDIFW have both telemetry equipment and expertise. When compared to the search for shore spawning locations, the cost of 40-50 radio tags would be de minimis.

The chance of locating salmon spawning in a large impoundment is extremely unlikely. MeDIFW included shore spawning as a possible secondary benefit of radio telemetry. FERC staff has now become focused on possible salmon shore spawning. While references to salmon shore spawning appear in the references,

the Licensee has failed to provide documentation of wild salmon spawning in a large lakes system with two major spawning tributaries. Furthermore, the success (eggs surviving to young-of-the-year) of such shore spawning events is unknown. It is difficult to imagine salmon spawned along a shoreline surviving an impoundment filled with chain pickerel, smallmouth bass, and yellow and white perch. The study plan as currently presented is unlikely to find spawning activity. The search for shore spawning appears an attempt to "prove a negative".

In rebuffing the use of radio tags, FERC staff ignores one of the primary study goals: (3) document evidence of spawning, e.g., spawning behavior and redd formation. Additionally, FERC staff fails to explain how behavioral aspects of pre-spawning salmon will be described. Impoundment elevation as well as water temperatures may inhabit movement into spawning areas; salmon may stage some distance from the spawning tributary, or move into another basin. Only radio tagging will demonstrate lacustrine behavior, which is the key goal of the initial study proposal.

As the study is now presented, it is simply "window dressing". Nineteen nineties information will be confirmed, and no new information will be provided. The Licensee and MeDIFW will be wasting their resources, resources that could be directed to studies relevant to Licensing issues.

I appeal to FERC staff and ask that they reconsidered the North Twin Tributary access study. Without the inclusion of radio telemetry further study is a waste of resources.

Thank you for the opportunity to comment

Ed Spear
307 Mt Hope Ave,
Bangor, Me, 04401
Edspear1@yahoo.com
Phone 207-217-4288

Ms. Kimberly D. Bose September 29, 2023
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Dear Secretary Bose, Via Electronic filing

Subject: Ripogenus Project P2572. Submission of Age and Growth Data from Scale Samples Removed from Landlocked Salmon of West Branch of the Penobscot River Angled in Spring of 2022.

The Age and growth data presented below, represents the current (2022) landlocked salmon (salmon) age and growth distribution of West Branch of the Penobscot River (West Branch) in the river reaches downstream of McKay Station. These data were collected from pools just above Nesowadenhunk Deadwater, the major salmon overwintering area. This reach was popular with anglers in the 1980s and 1990s. Sampling location and methods (angling) are comparable to 1980's West Branch angler catch data filed in the 1991 FERC Application shown in the tables below.

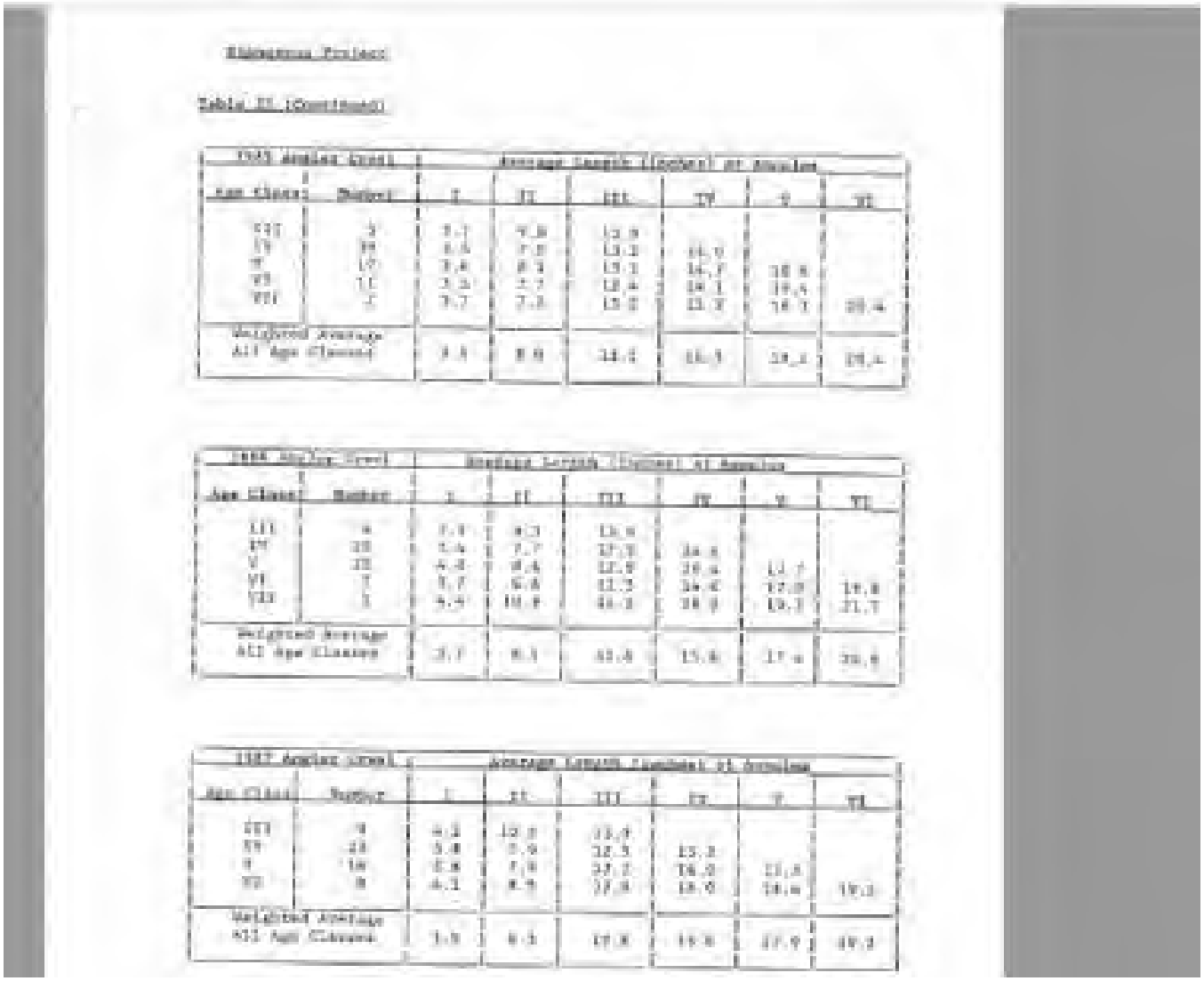
Salmon were collected over a four-week period that included nine sampling events (fishing trips) that typically lasted six hours. Salmon were caught by fly and landed using a rubber net, measured and a scale removed from the peduncle area near the lateral line. When obvious, spawning history was noted. The Maine Department of Inland Fisheries and Wildlife read the scales in September. Included in the 2022 sample were a number of salmon less than 14" (the historic legal-size limit), these fish were not included in the table shown below.

| | Landlocked Salmon Great Than 14 inches Angled from the Nesowadenhunk Deadwater Area Spring 2022. Lengths are in inches at the time of annulus formation. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Number | AGE ! | AGE II | AGE III | AGE IV | AGE V | AGE VI | AGE VII | |
| | IV | 5 | 3.5 | 8.1 | 11.4 | 14.0 | | | | |
| | V | 3 | 3.6 | 7.0 | 10.6 | 12.6 | 14.1 | | | |
| | VI | 6 | 3.2 | 6.4 | 10.7 | 13.5 | 15.0 | 16.4 | | |
| | VII | 1 | 2.7 | 7.5 | 10.0 | 11.5 | 13.2 | 15.6 | 16.9 | |
| | | | | | | | | | | |
| | Average N weighted | | 3.3 | 6.7 | 10.6 | 13.2 | 14.5 | 16.3 | 16.9 | |
| | | | | | | | | | | |

When compared to 1980's salmon growth data (see table shown below), the current (2022) West Branch salmon population has undergone a precipitous decline. Salmon collected in 2022 were typically a year or more behind in growth (rate) when compared to the historic (1985-

1987, Ripogenus Project Application, 1991, Vol. IX) tabular data shown below. This slow salmon growth is most obvious as fish reach their third or fourth growing season and when the absence of suitable food sources, rainbow smelt (smelt) in this case, becomes apparent.

*Ripogenus Application, 1991 Vol IX  Table 37*



Intellectual integrity requires that I note that salmon in reaches e.g., the Lit le  Eddy and Big Eddy, closer to McKay Station are typically  larger (in length) as they are closer to any McKay Station tailwater effects. The upstream tailwater effect is most noticeable on sub adult salmon. However, these “upriver” fish would only have been a small component of the historical data set. The Licensee has, or should have, archival fisheries data sheets and can make statistical comparisons.

The comparison between 2022 and 1995-1997 data demonstrates the diasterous reduction in salmon growth rates brought on by the Licensee’s change in project operations. Smelt, the

primary food source of adult salmon, abundance has declined if not disappeared in recent years. The West Branch is no longer the fisheries FERC described in the Environmental Impact Statement of 1996.

The Licensee has constantly repeated the idea that nothing has changed with the shift to McKay Station peaking operations and earlier impoundment drawdowns. The Licensee has fought all study requests that would provide current fish and aquatic communities data that could be compared to information in the 1991 FERC Ripogenus Project Application. Information presented in this filing demonstrate the fallacy of this pipe dream/negotiating position. Clearly the Ripogenus Project is not meeting MeDIFW fisheries management goals or Maine Department of Evironmental Protection water quality standards.

The licensee's June 2021 Pre-Application Document referenced "data gaps", actually voids, this position remains unchallenged and unchanged. I urge FERC staff to ignore the Licnesee's posturing and require the Licensee to collect information e.g., plankton, smelt spawning success, food requirements, habitat availability (lit oral areas), and downstream smelt drift. This information would provide a description of the existing fish and aquatic communities as well as a course to action that could require modifications of future project operations.

Thank you for the opportunity to present these data.

Ed Spear
307 Mt Hope Ave.
Bangor, Me 04401
Email: edspear1@yahoo.com
Phone: 207-217-4288

COVER SHEET FOR FERC EFILING

In Regard to:

Docket # P 2572-133

Dam Relicensing, Great Lakes Hydro America

Aesthetics Study

Comments from Jeffrey L Fayle

My name is Jeff Fayle. I was invited to the Aesthetics Study Focus group but am unable to attend due to a moose hunt, so I wanted to share my input with you via mail. I am a member of the Board of Directors of The West Branch Historical Preservation Committee. I am also a Registered Maine Guide, as well as President of the Chesuncook Dam Association since its inception. I've had a camp on Chesuncook Lake for over 60 years.

First, it is clear that this study group should have been formed from the very beginning, as FERC requested. In addition, Kleinschmidt Associates are not the ones who should be choosing what locations get assessed and definitely not the ones doing the assessing. The relicensing is flawed, in that an unbiased entity should have been hired to do the studies. My concern is that these studies may be designed by the licensee to tactically withhold relevant data.

The scoring of the KOP's is unfathomable to me. Every KOP above Ripogenus dam received a "B" grade. How can this be possible when the State of Maine considers these lakes "outstanding resources in need of policy protection"? Yet GLHA rated them no higher than the Ambajesus Wall – which is nothing but a metal wall built alongside a road! These ratings seem absurd to anyone who knows the area and may reflect a distinct bias towards water below Ripogenus. The aesthetics and remoteness of the region are the reasons why the College of the Atlantic, Matagamon Wilderness Base, Outward Bound, Camp Winnebago and many more groups make multiple canoe trips down Chesuncook each year.

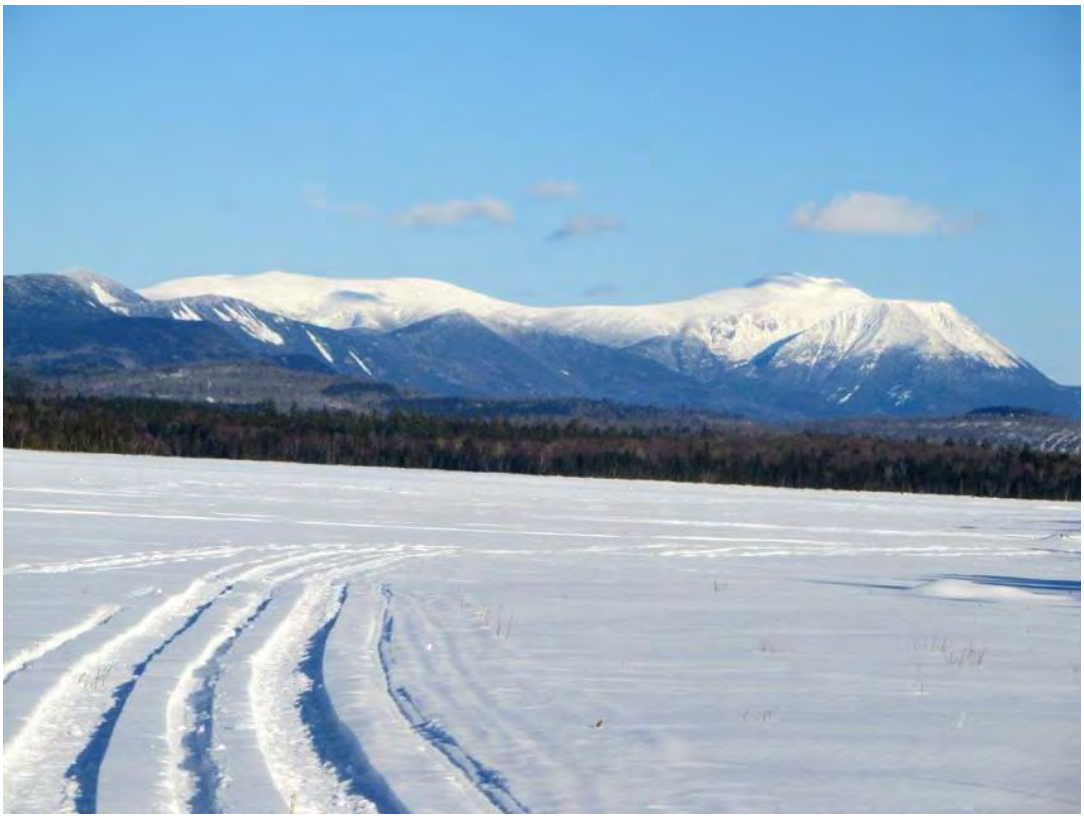
Furthermore, please note that "Chesuncook Lake from a boater's perspective" received a Landform score of only 1! Yet it sits at the foot of Mount Katahdin, the tallest mountain in Maine and at the end of the Appalachian trail! How can this possibly be described as "low rolling hills, foothills?"

Chesuncook Boater's perspective also received an Influence of Adjacent Scenery score of 2 as "Somewhat enhances overall visual quality," while the Ambajesus Boat Launch and Ambajesus Wall received a score of 3 as "moderately enhances overall visual quality." Metal walls and boat launches do not enhance visual quality at all, while grand mountain vistas obviously do. The KOP's from a "boater's perspective" in no way capture the visual appeal of Chesuncook, Caribou and Ripogenus lakes. The images chosen don't even include the surrounding mountains such as Big Spencer, the Katahdin range, and the Gorman chairback range.

New locations and scoring must be completed for the boater's perspective on Chesuncook, Caribou and Ripogenus lakes. Remote campsites that include views of the lakes such as Mouser Island, Cardiser and Sandy Point should be included in the second study. Images of the lakes that capture the surrounding mountains must also be included. The study needs to be realistic and honest. Please view the attached photos!

Jeff Fayle

TWO VIEWS TAKEN FROM BPL CARDESIR POINT CAMPSITE – NO WONDER PEOPLE LIKE TO CAMP THERE.





SUNSET OVER SPENCER MOUTAIN - CHESUNCOOK BOAT LANDING, FACING WEST



EVENING FISHING NEAR CHESUNCOOK BOAT LANDING



MOUNTAIN VIEW - CONVERGENCE OF RIPOGENUS AND CHESUNCOOK FROM A BOATER'S PERSPECTIVE



LESS THAN .5 MILE FROM CHESUNCOOK LANDING FACING EAST



ANOTHER SUNSET VIEW FROM CHESUNCOOK, LOW WATER LEVELS



LUMBERMAN'S MEMORIAL/MILKY WAY, COURTESY OF STEPHEN PAGE,

TAKEN AT CHESUNCOOK BOOMHOUSE AND PUBLIC LANDING. NOTE THE LACK OF LIGHT POLLUTION.



Kimberly D. Bose October 12, 2023
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426 Via Electronic Filing

Dear Secretary Bose,

Re: The Ripogenus Projects P-2572, Appeals and Requests regarding FERC's September 19, 2023 filing Determination on Requests for Study Modifications and New Studies for the Ripogenus (P- 2572) and Penobscot Mills (P- 2458) Hydroelectric Project

Regarding FERC's September 19, 2023 filing, it is important to point out certain errors and omissions that are central to the Licensee's relicensing efforts. This filing is now part of the record. Several of these comments are patently wrong and need to be corrected.

Rainbow smelt (smelt) are the key environmental issue. Ripogenus Impoundment smelt including their "drift" into the West Branch of the Penobscot River (West Branch) below McKay Station are the central fishery issue. The status of the Project's smelt populations remains undefined and requires lacustrine and riverine studies that would fill these data gaps or voids.

This filing requests that FERC correct the record by removing facts not in evidence and substituting factual information. Once the body of information is reviewed, I ask FERC to reconsider its findings and reverse 1) their position on the current status and availability of smelt in the Ripogenus Impoundment and downstream West Branch and 2) the need for funding of a MeDIFW West Branch creel survey.

FERC policy appears to consider existing environmental conditions as baseline. However, in the (re ) Licensing of the Ripogenus (P- 2572) and Penobscot Mills (P- 2458) Hydroelectric Project FERC has consistently depended on 35–40-year-old data found in the 1991 Great Northern Paper License Application. This action is not FERC's definition of baseline. To further exacerbate the process, the few FERC required studies (Fish Assemblage, Outage Study) along with MeDIFW Ripogenus Impoundment creel surveys and limited smelt drift net samples all demonstrate a system that has significantly declined since 1991. Additionally, the Licensee should be required to defend all its current position that "nothing has changed", including Wes Branch angler use. In fact, historically the projects were operated with steady base flows 24-7. Now the projects are dispatched to follow electric market conditions. The burden of proof should lie with the Licensee to demonstrate otherwise.

The current FERC licensing process appears to encourage Stakeholder participation in this licensing format. However, there is little evidence that stakeholder comments have been thoroughly reviewed, or formal literature citations analyzed and their conclusions accepted or rebutted. I, along with other Stakeholders, put a great deal of efforts into our comments. These comments are intended to provide additional information to the licensing process or request that needed information is provided.

The Stakeholders and, to a lesser degree, the agencies are being treated as second class citizens. Unless comments and study requests reflect favorably on the Licensee's so called data, Stakeholder comments are summarily dismissed. Too often FERC filings accepts the Licensee's positions and views of the existing environment conditions without providing current quantitate information to support their position. A casual reader might surmise that much of FERC's September 19, 2023 filing was a product of "cut and paste" from the Licensee's filings.

The below text outlines the errors and omission found in the Smelt and Creel Survey Studies denial. Explanations are provided, and when possible correct information is also provided

Smelt Study (Request denied)

Background

The SPD included a Fish Assemblage Study of the Ripogenus impoundment and the West Branch downstream from Ripogenus Dam. The SPD erroneously continues "*GLHA conducted the study and documented the presence of smelt in the Ripogenus Impoundment, as well as the occurrence of smelt "drift*" through McKay Station downstream to the West Branch." This statement is incorrect, no studies or study results exist.

In dismissing the Smelt Study request, FERC writes in the September 19, 2023 filing "*Mr. Spear provides similar reasoning on the need here for the smelt study, with little additional support or explanation as to how such a study would inform a licensing decision [sections 5.9(b)(4) and (b)(5)]".* As explain below, this statement is simply wrong as FERC's earlier filings are based on facts (data) not in evidence. Rather FERC used subjective judgement, and the Licensee's faulty assumptions in denying study requests. There were no instances where FERC reviewed any of the multiple references and rebutted the many authors and publications cited. Perhaps even worse, FERC uses legal filing protocols as a reason to dismiss valid claims.

> "*The results of the Fish Assemblage Study, as presented in section 5.0, Results, of Appendix D to the ISR, along with Great Northern Paper's historical sampling* data and

***1)*** *Great Northern Paper's historical sampling data. Maine DIFW's past and on-going smelt "drift" studies are sufficient for an analysis of the effects of project operation on the smelt population in the Ripogenus impoundment and the amount of smelt drift downstream into the West Branch [section 5.9(b)(5)]. There has been no material change(s) in the law or regulations applicable to the information request [section 5.15(e)(1)],*
***2)*** *nor has there been a significant change in the project proposal or*
***3)*** *significant new information material to the study objectives that has become available [section 5.15(e)(4)]."*

1) This reference to 35 year old smelt collection data was well before the Licensee changed project operations to a peaking mode. The fish and aquatic communities that existed 35-40 years ago are not relevant to current conditions brought on by the change in project operations.

   FERC staff writes, "DIFW's past and on-going smelt "drift" studies". Unless used as a term of art, *smelt "drift"* and "*studie*s" are both incorrect and misleading. Based on time available, MeDIFW collected smelt for short periods during 2021 and 2022. Based on conversation with MeDIFW, 2021 smelt drift net sampling occurred on 12 occasions. No smelt were present in one event, and two other events each produced one smelt. If corrected for flow and expanded, the correction factor would be between 50 and 100. As these data are from MeDIFW files, it is appropriate to let MeDIFW continue with any further analysis. In what could be considered deceptive, the Licensee was aware of these 2021 smelt collections and failed to publish them!

2) While MeDIFW deserves full credit for taking the initiative, smelt collections based on the availability of staff, were not studies in the same context or intensity as official reviewed and approved licensing studies. Short term 2021 and 2022 "grab samples" do not qualify as studies. Furthermore, to suggest that they were on par with the GNP studies during the 80s and early 90s is incorrect. In addition, <u>there are no ongoing 2023 smelt studies.</u>

Additionally, FERC writes "*GLHA conducted the study and documented the presence of smelt in the Ripogenus Impoundment, as well as the occurrence of smelt "drift" through McKay Station*". This statement is also wrong. The Licensee never made any direct effort to undertake smelt "collections" and never claimed they did! Smelt collected in the fish Assemblage Study, while insightful, were a bycatch.

3) FERC staff claims there has been no significant change "in the project proposal". In real time they are correct but they fail to mention that the "smelt issue" dates back to filings made in 2021. FERC staff and the Licensee

ignored similar requests made in 2021 and 2022 and now FERC states the request is too late!

3a) Citing chapter and verse, FERC staff claims no new information has become available. Again, FERC staff is simply ignoring the facts. The Fish Assemblage Study found a disproportional number of older, large smelt in the Ripogenus Impoundment. Salmon growth in the Ripogenus Impoundment and downstream West Branch (September 29, 2023 filing, accession number 20230939-5100 ) continues to be below MeDIFW standards. How much new information is needed before the necessary studies are mandated?

Regarding smelt collections FERC Staff claims "appropriate methods have not been described". FERC staff has repeatedly used the term "smelt drift" which implies a tacit understanding of previously described methodology. MeDIFW essentially duplicated GNP's collections methods (the MeDIFW collection site was a few hundred yards downstream) Repetition of smelt collection methods would be redundant but can be easily provided upon request.

FERC staff continues to rely on the underfunded and under staffed MeDIFW rather than the well-funded and well-staffed Licensee for information needed to meet environmental mandates. FERC references MeDIFW smelt studies including unpublished data yet to be provided. No smelt information has been presented, and from conversation with MeDIFW, their time available sampling simply confirmed an occasional smelt drift. The Licensee's statement that the few smelt collected in 2021 and 2022 match abundances described in the 1991 License Application is a gross misinterpretation of information. As noted above, I have seen no MeDIFW "smelt" filings nor I have I seen any smelt drift nets, to date, there is no on-going (2023) smelt study.

FERC continues with a discussion of juvenile smelt life history including prey preferences, plankton. "*Edward Spear states that the smelt information included in the ISR shows a population of larger-sized smelt that are too big to serve as prey for adult landlocked salmon. " Mr. Spear claims that, in addition to cannibalism; reduced abundance of zooplankton; reduced, fluctuating, or lost littoral areas; a reduced volume of water between surface- and deep-water layers in the impoundment (or metalimnion); and turbidity are known factors affecting smelt populations. Mr. Spear recommends that GLHA conduct a smelt study of the Ripogenus impoundment that focuses on spawning, egg survival, fry escapement, zooplankton availability (with an emphasis on rotifers), and survival of smelt through their first year. The goal of this study would be to assess the status of the Ripogenus smelt population by following an age class from egg to*

*Age 1, as well as to determine the contribution, if any, of this cohort to the prey base in the West Branch downstream from McKay Station and the salmonid fishery*"

FERC concludes "*Mr. Spear provides similar reasoning on the need here for the smelt study, with little additional support or explanation as to how such a study would inform a licensing decision [sections 5.9(b)(4) and (b)(5)*". FERC's denial of this phase of the smelt study repeats the Licensee's erroneous assumption that the Ripogenus smelt population is providing the needed salmonid smelt forage base. There is simply no information on the health (condition, K-Factor) and status of the downstream West Branch salmon population. The apparent decline in the Ripogenus smelt population is an impact of current Project operations.

FERC's total avoidance of any smelt studies recommendation is even more profound given studies required at Aziscohos Hydroelectric Project, FERC No. 4026. This study focused on Smelt access and success of spawning during spring refill at Aziscohos Lake and in the process identified smelt egg siltation issues. Umbazookas Stream flows into a large embayment. Deer and Brandy Pond inlets are also associated with shallow embayments that would be vu*lnerable to siltation during refilling.* I fail to understand the differences and importance of salmonids and smelts in these two impoundments and why one study is being conducted and the other denied.

FERC continues "*with little additional support or explanation as to how such a study would inform a licensing decision"*. The answer is both obvious and quite simple. Once the problem(s) with the smelt population(s) is/are identified, corrective measures e.g. drawdown limits and timing, can be prescribed. Without any current information, the Licensee has made far-fetched statements regarding fish and aquatic communities that FERC seems to accept at face value. The health and abundance of smelt is of primary importance to the project's salmonid fisheries and the 1996 Environmental Impact Statement discussed the salmon/smelt relationship. MeDIFW has indicated that there are insufficient smelt to feed the Ripogenus Impoundment salmon population. It seems the burden of proof regarding smelt and other aquatic communities lies with the Licensee. Thus, how can FERC staff make an informed decision without data? If FERC staff agrees that project operation has decimated the Ripogenus juvenile smelt population they should say so.

In summary, FERC statements concerning on- going MeDIFW studies are incorrect. There are no ongoing studies. There are NO current or recent quantitative data on the Ripogenus smelt population and downstream smelt drift. If fact, other than the few Ripogenus impoundment smelt collected in the fish assemblage study, there are no smelt data.

Creel Survey (Denied)

Comments on the Requested Study

Clearly FERC has the authority to deny any study requests. However, I take issue with their interpretation of MeDIFW's comments and their understanding of what an angler creel survey entails. Equally clear is that MeDIFW policy mandates creel surveys. From the INLAND FISHERIES AND HATCHERIES STRATEGIC MANAGEMENT PLAN 2021–2035. Landlocked Atlantic Salmon, *Goals, Objectives & Conservation/Management Strategies "Reevaluate salmon waters that haven't been recently assessed to ensure existing regulations reflect current management goals and angler behavior"*

A census is defined by Merriam-Webster as " *a usually complete enumeration of a population where information is collected"*. Angler survey boxes do not meet this definition. FERC does not seem to understand the difference in the "fisheries management" level of subjective information collected as opposed to a creel survey where quantitate data are collected. Fisheries management includes a number of measures including the passive, "no action" option. Spot fish collections, mail surveys, or angler complaints, none involving large, if any data sets, can result is management changes. The licensing process requires current data rather than an overview, subjective judgement or the use of 35-40-year old data. The recreation survey is simply "window dressing" and will provide no quantitative data.

FERC writes "*In its comments, Maine DIFW provides its rationale for not requesting clerk angler surveys as part of the relicensing. The reasons include: (1) the need for consistency and repeatability in survey methodology; (2) the availability of ample, recent angler survey data from summer and winter 2021 collected by Maine DIFW; (3) the fact that Maine DIFW has the information currently needed to assess the fishery and respond with management changes, as necessary; and (4) plans by Maine DIFW to survey the Ripogenus Project and the West Branch in 2025"*

1) FERC cites MeDIFW comment "*the need for consistency and repeatability in survey methodology"* as a reason for denial of the creel survey study request. This request clearly stated that it would be conducted by MeDIFW following their protocols In this case FERC's objection is a circular agreement and unrelated to my initial request. Furthermore, If "*repeatability*" is the criterion there would be few creel surveys; a one year creel survey is not unheard of. Should 2024 creel survey result in angler use and catch numbers similar to those found in the 1991 License Application, additional study years would not be required.

2) FERC misinterpreted MeDIFW's comments that clearly indicated they would conduct a West Branch creel survey if funding and staff became available. There are no current angler creel census data. Angler survey box results do not qualify in a

thirty-year Licensing event. MeDIFW wrote extensively that they lacked funding and staff. MeDIFW has no venue where they can directly ask for funding. However, the connotation of their statements is clear; they want to conduct a West Branch creel surveys ….in house.

A simple test of the above would be to offer MeDIFW funds to staff a West Branch survey clerk as well as transportation costs. MeDIFW acceptance or denial of the "offer for funding" would be conclusive.

3) There is "*availability of ample, recent angler survey data from summer and winter 2021 collected by Maine DIFW;"* FERC included one item (Ripogenus 2021 summer and winter data) that is true and couples it to a falsehood (implied reference to West Branch angler creel survey information). While there is 2021 Ripogenus Impoundment winter-summer survey data, that is irrelevant to the question at hand: what is the daily West Branch summer angler, use and catch? There is no West Branch creel survey data as angler creel survey boxes are simply no substitute for face-to-face methods that produce quantitative results. Furthermore, if MeDIFW has provided the Licensee with angler information other than from the biased "angler survey boxes", this information needs to be provided to the stakeholders

I urge FERC Staff to disregard the baseless fish and aquatic communities' information continuously presented by the Licensee. This phase of the Licensing process is intended to collect information. The Licensee has fought all stakeholder efforts to collect quantitative fish and aquatic communities' information. The Licensee is attempting to describe the Ripogenus Project fish and aquatic resources in a fanciful manner that cites 35 year-old data along with the gross misuse of MeDIFW data. FERC continues to avoid addressing the litany of valid complaints developed by the stakeholders and resource agencies. Archival 35-year-old Information provided by the Licensee will be of no use to FERC staff when competing uses and balancing of resource needs to be considered.

The above comments reflect my concerns with fish and aquatic communities, and angler information provided by the Licensee. The requested information will become the base of the Stakeholder case as we move forward in this complicated process. Thank you for your patience and the opportunity to comment.

Ed Spear
307 Mt Hope Ave.
Bangor, Me 04401
Email: edspear1@yahoo.com
Phone: 207-217-4288

Kimberly D. Bose October 13, 2023
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426 Via Electronic Filing

Dear Secretary Bose,

RE: Project No. 2572-136 FERC August 22, 2023 response regarding October 2021 to April 2022 Flow Deviations, and Allegations of June and October 2022 Flow Deviations and Stranding Effect

FERC's August 22, 2023 well-reasoned response to Article 402 multiple 2022 low flow events ignores the clear violation of Article 406 flow requirements. As required by Article 406, the Holbrook Bypass Channel is a critical enhancement measure designed to support the continued repopulation of the West Branch of the Penobscot River (West Branch) Landlocked salmon (salmon) population. Both outage and low minimum flows have eliminated fisheries benefits provided for by Article 406. While outage flows are beyond the Licensee's control, West Branch minimum flows are the sole responsibility of the Licensee.

The Holbrook Bypass Channel (Bypass Chanel) was designed to provide flows based on Great Northern Paper production power needs; relatively stable base flows, typically 2500 cfs. Peaking flows were unforeseen. As a matter of physics, when the Licensee reduces McKay Station outflows, inflow to the Bypass Channel is reduced. At 1100 cfs all enhancement measures are lost. The Licensee controls McKay Station flow and bares total responsibility for reduced operating flows. FERC failed to fully acknowledge or prescribe remediation to this ongoing problem.

FERC's only comments regarding the Holbrook Bypass Channel were a quote from my May 31, 2022 filing, and one found in Fish Stranding Study section: "There was no change in water elevation in the Holbrook Side Channel". Without baseline information e.g., flow and elevation data, this comment is meaningless. In short, FERC failed to clearly identify and deal with low/lost Holbrook Bypass flows during outage and minimum flow events and the concurrent loss of juvenile salmon production.

FERC's filing demonstrates that they understand the impacts of low flows on the West Branch fish and aquatic communities in the main channel. However, understanding Article 406 is equally important. McKay Sation flows below approximately 2200 cfs result in the failure to meet the 35 cfs Holbrook Bypass summer flow requirements that are provided

by one of two gates. Low McKay Station outflows compromise all Bypass Channel juvenile salmon production goals. During outages or the 1000 cfs minimum flow, any enhancement is totally lost as the Bypass Channel dries up.

FERC references Standard Article 15, that in part states " *… the licensee shall, for the conservation of development of fish and wildlife resources... comply with such reasonable modifications of the project structures and operation, as may be ordered by the Commission upon its own motion... after notice and opportunity for hearing.....*" While this statement was in the context of Ripogenus Dam gate modifications needed to meet emergency flow needs, it applies equally to Article 406, the Holbrook Bypass Channel. Both License Articles are equally important. A change in the existing McKay Station minimum operating flow from 1000 cfs to 2000-2200 cfs would provide critical additional protection. Development of a method or methods to open the second Bypass Channel gate could also provide emergency flow during low flow periods.

When the stakeholder identified the impacts of McKay Station outages, FERC quickly responded. The August 22, 2023 filing requested development of interim protection measures in the event of McKay Station outages. When implemented, these flows will reduce stranding. In addressing the lost enhancement measures intended by Article 406, I urge FERC to act in a similar manner. The West Branch salmon population can not withstand another two to three years of lost juvenile production.

Thank you for the opportunity to comment.

Ed Spear
307 Mt Hope Ave.
Bangor, Me 04401
Email: edspear1@yahoo.com
Phone: 207-217-4288

William Cushing, Millinocket, ME.
To whom it may concern,

My name is William Cushing. I represent Andre Emerson Cushing Corporation ("AEC"). AEC is majority owner in T3-R12 WELS ("312"). 312 Comprises 80% of Ripogenous Lake and nearly 20% of  Chesuncook Lake, with shorefront from Holmes Hole on the eastern shore of Chesuncook down around the southern end and then back up to Caribou Point to the west. 312 Has been a part of our family timber holdings for 153 years. I have been on Chesuncook Lake since 1964. For the last 13 years, I have lived nearly year-round in the camp my grandfather built in 1954 on Ripogenus Lake.

From an aesthetics perspective: it has come to my attention that the Kleinschmidt/Brookfield assessment of the view shed at Chesuncook Lake is being compared to Dolby Pond and Ambejesus Lake. This leaves me quite incredulous. First, Dolby Pond and Ambejesus Lake are "in-town" bodies of water. Ambejesus Lake is typical a typical "camp lake," as the camps are side by side by side like on Smith Pond or any other pond easily accessible from town. Dolby Pond is a stump field with a few feet of water in it, and is designated as a pond.

Chesuncook is a completely different animal. First, we are 30 miles in on the Golden Road. We are smack in the middle of the largest timber basket in the Lower 48 States at 9,000,000 acres.  And we are talking about the Allagash Wilderness Waterway. Chesuncook is the gateway to the Allagash Wilderness Waterway. This waterway is one of Maine’s crown jewels, with all of God’s creatures and everything that grows on display for all to see. The waterway is known all over the globe and is visited by people from everywhere. We are also talking about H.D. Thoreau. This is the land he wrote about and made famous to the world. The view shed here is peerless. Chesuncook runs parallel to the Katahdin Range. From one end of the lake to the other, you run right alongside the entire range, with perspectives only attainable by boat or air. We are remote, but once here, the experience is something every visitor carries with them for the rest of their days. You just cannot say that about Dolby Pond.

I hope this clears up any questions you may have about the Chesuncook area. I hope that Kleinschmidt/Brookfield, moving forward, engage with honesty and integrity with those who live in thrive here in the Northwoods, as we are still waiting for the recreational study that they were reminded of back in May.

I would also like to take this opportunity to invite the FERC representatives to come and visit us.  I would be happy to host lunch and take the representatives on a boat tour of the lake in the spring/summer of 2024. I hope it’s an offer you can’t refuse.

Thank you for your attention,

William Cushing
Director
Andre Emerson Cushing corp.

Brookfield
Renewable U.S.

October 26, 2023

***Via eFiling***

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Notice of Operations Model Technical Workshop**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), Licensee of the Ripogenus Hydroelectric Project (No. 2572) and the Penobscot Mills Hydroelectric Project (No. 2458) (collectively referred to as the "Projects"), herein is providing notification of the date and location for the upcoming Operations Model Study Technical Workshop to be hosted by GLHA.

**Background**

On June 11, 2021, GLHA filed the Notices of Intent and a Pre-Application Document (PAD), which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through FERC's Integrated Licensing Process (ILP). On March 23, 2022, GLHA filed the Revised Study Plan (RSP), and on May 13, 2022, FERC issued the Study Plan Determination (SPD). Pursuant to the RSP and as approved and modified by FERC's SPD, GLHA performed first season study activities in 2022 with available results provided in the Initial Study Report (ISR) filed with FERC on April 24, 2023. Subsequent to filing the ISR, stakeholders filed comments on the ISR and new study requests, and on September 19, 2023, FERC issued the second SPD.

**Operations Model Technical Workshop**

Pursuant to the RSP and FERC-issued SPDs, GLHA developed an operations model designed to evaluate alternative operating scenarios in support of the ongoing relicensing of the Projects. During the May 2, 2023 ISR Meeting, GLHA described how the operations model was developed, calibrated, and verified.

Building off the information presented during the ISR Meeting, GLHA will be hosting a 2-day, ***in-person*** Operations Model Technical Workshop. The purpose of the workshop is to further explain the model inputs, calibration, and verification. During the workshop, GLHA will describe how the model is being used in support of the relicensing, how to request alternative operating scenarios, and how to interpret the model results. All stakeholders interested in learning more about the operations model are invited to attend this workshop.

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

The workshop will be held ***in-person*** at the GLHA's Office located at 1024 Central Street in Millinocket, Maine 04462 over two consecutive days, on December 5-6, 2023.

In order to plan accordingly, GLHA respectfully requests stakeholders who plan on attending the workshop RSVP by contacting Cate Russell at Cate.Russell@hdrinc.com or (207) 239-3792 at your earliest convenience but no later than November 28, 2023.

The anticipated agenda for the workshop is provided below.

**Tuesday, December 5, 2023 (9:00 AM to 4:00 PM)**

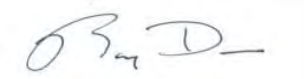
1. Logistics, Safety, and Introductions (9:00 – 9:15)
2. Meeting Purpose (9:15 – 9:30)
3. Relicensing Schedule (9:30 – 9:45)
4. Overview of Projects (9:45-10:30)
5. Overview of the Operations Model (10:30 – 12:00)
6. Lunch (12:00 – 1:00)
7. Model Hydrology (1:00 – 1:30)
8. Model Verification (1:30 – 2:00)
9. Overview of Model Interface and the Operations Baseline (2:00 – 4:00)

**Wednesday, December 6, 2023 (9:00 AM to 12:00 PM)**

1. Overview of Requests for Alternative Operating Scenarios (9:00-10:00)
2. Overview of Interpreting Model Run Results (10:00-12:00)

If you have any questions regarding this information, please contact me by phone at (207) 775-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman, Licensing Manager
Brookfield Renewable

cc: Relicensing Distribution List

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

**Federal Agencies**

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Stephanie Carman
Acting District Manager
Northeastern States
Bureau of Land Management
626 E. Wisconsin Avenue, Suite 200
Milwaukee, WI 53202-4617

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Kimberly Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Karen McGuire
New England Region 1
Deputy Regional Administrator
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

**State Agencies**

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Kyle Olcott
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Peter Jamieson
Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
40 Western Avenue
E.S. Muskie Federal Building, Room 412
Augusta, ME 04330

Stacey Guerin
State Senator
3 State House Station
Augusta, ME 04333

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House Minority Office
Room 332, State House
2 State House Station
Augusta, Maine 04333

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3 State House Station
Augusta, ME 04333

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House Minority Office
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**Native American Tribes**

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
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Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Rena Newell
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

**Additional Parties**

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

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American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
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Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground
ssindo@chewonki.org

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund
sperry@maine.com

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Jesika Lucarelli
Great Mountain Guide Service
greatmountaings@gmail.com

Mark Nadeau
International Association of Machinists
245 Pamola Park
Millinocket, ME 04462

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

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Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
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Concord, MA 01742-3202

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Rutland, VT 05701-3511

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Maine Professional Guides Association
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Wilton, ME 04294-4040

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Maine Professional River Outfitters
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Millinocket, ME 04462-0669

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Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing
mary@mxhmarketing.com

Matt Polstein
New England Outdoor Center
matt.polstein@gmail.com

Michael Smith
Outdoor Sport Institute
176 Highland Ave
Millinocket, ME 04462

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Allison Economy
Representative for Allagash Gateway Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Thomas Nannery
Sportsman's Alliance of Maine
205 Church Hill Rd
Augusta, ME 04330-9801

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Brian Stranko
Maine Program Manager
Trout Unlimited
Brian.stranko@tu.org

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,
sharon.klein@maine.edu

Dean Beaupain
dean@bloomerrussell.com

Jeff Fayle
jfayle@gmail.com

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti
granby@cox.net

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris
nsharris@mgh.harvard.edu

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Christopher Howe
funpow89@yahoo.com

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

Brookfield
Renewable U.S.

November 1, 2023

***Via eFiling***

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Fourth Study Progress Report**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), Licensee of the Ripogenus Hydroelectric Project (FERC No. 2572) and the Penobscot Mills Hydroelectric Project (FERC No. 2458) (collectively referred to as the "Projects"), herein files with the Federal Energy Regulatory Commission ("FERC" or "Commission") the Fourth Study Progress Report for the relicensing of the Projects. The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot counties, Maine.

The current licenses for the Projects were issued on October 22, 1996 and expire on September 30, 2026. On June 11, 2021, GLHA filed the Notices of Intent and Pre-Application Document, which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through the Commission's Integrated Licensing Process (ILP). On March 23, 2022, GLHA filed a Revised Study Plan (RSP) for the Projects, and the Commission issued the Study Plan Determination (SPD) on May 13, 2022. GLHA performed first season study activities in 2022 with available results provided in the Initial Study Report (ISR) filed with FERC on April 24, 2023. Subsequent to the filing of the ISR, stakeholders filed comments on the ISR and new study requests, and on September 19, 2023, FERC issued the second SPD.

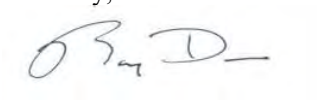
Pursuant to the RSP, GLHA herein submits the Fourth Study Progress Report for the period from August 1 through October 31, 2023 for the Projects. The enclosed table (report) provides a list of the required studies and associated status of progress, as well as any modifications to the approved methodologies.

Concurrent with this filing, GLHA is providing a copy of this letter to all parties listed in the attached distribution list. A copy of the Fourth Study Progress Report can be downloaded from FERC's eLibrary system at https://www.ferc.gov/docs-filing/elibrary.asp by conducting a search using the docket numbers p-2458 and/or p-2572.

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

If you have any questions regarding this information, please contact me by phone at (207) 775-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman, Licensing Manager
Brookfield Renewable

cc: Relicensing Distribution List

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

**Federal Agencies**

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Stephanie Carman
Acting District Manager
Northeastern States
Bureau of Land Management
626 E. Wisconsin Avenue, Suite 200
Milwaukee, WI 53202-4617

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Kimberly Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

Leonard Rawlings
FERC Coordinator
Eastern Region
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Karen McGuire
New England Region 1
Deputy Regional Administrator
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

**State Agencies**

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Kyle Olcott
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

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Michael Michaud
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Millinocket, ME 04462-0123

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Senior Counsel
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Atlanta, GA 30348-5605

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Millinocket, ME 04462

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Millinocket, ME 04462

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Concord, MA 01742-3202

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Yarmouth, ME 04096

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President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing
mary@mxhmarketing.com

Matt Polstein
New England Outdoor Center
matt.polstein@gmail.com

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Outdoor Sport Institute
176 Highland Ave
Millinocket, ME 04462

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President
Pray's Big Eddy Campground, Inc.
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Augusta, ME 04330-9801

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3 Spruce Lane
Cumberland Foreside, ME 04110

Brian Stranko
Maine Program Manager
Trout Unlimited
brian.stranko@tu.org

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,
sharon.klein@maine.edu

Dean Beaupain
dean@bloomerrussell.com

Jeff Fayle
jfayle@gmail.com

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti
granby@cox.net

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris
nsharris@mgh.harvard.edu

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Christopher Howe
funpow89@yahoo.com

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Charles Paone
cpaonejr@gmail.com

Richard Parkes
Rparkesbb3@yahoo.com

Edward Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Robert Van Deventer
bobvnert@gmail.com

Wes Zemrak
2 Brookside Drive
Falmouth, ME 04105

FOURTH STUDY PROGRESS REPORT

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>Third Study Progress Report<br>(August 1, 2023 through October 31, 2023) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 1a | Water Quality Study – Impoundment Lake Trophic Assessment | Study completed as required in 2022 with study results provided in the ISR. | None. |
| 1b | Water Quality Study – Downstream DO/Water Temperature Assessment | • First season study activities were completed as required in 2022 with study results provided in the ISR.<br>• Based on comments during the ISR Meeting and pursuant to FERC's SPD issued September 19, 2023, additional water temperature data was collected at three monitoring sites in the West Branch downstream of Stone Dam in June and July 2023.<br>• Data collected in 2023 will be provided in the USR. | None. |
| 1c | Water Quality – Benthic Macroinvertebrate Assessment | • First season study activities were completed as required in 2022 with study results provided in the ISR.<br>• Additional macroinvertebrate data was collected in 2023 at two locations in the West Branch downstream of Stone Dam.<br>• Data collected in 2023 will be provided in the USR. | None. |
| 1d | Water Quality – Impoundment Aquatic Habitat Assessment | Study completed as required in 2022 with study results provided in the ISR. | None. |
| 1e | Water Quality – Riverine Aquatic Habitat Assessment | Study completed as required in 2022 with study results provided in the ISR. | None. |
| 2 | Instream Flow and Habitat Assessment of West Branch below Stone Dam | Study completed as required in 2022 with study results provided in the ISR. | None. |

GREAT LAKES HYDRO AMERICA, LLC
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

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|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 3 | Fish Assemblage Survey Study | • First season study activities completed in 2022 with study results provided in the ISR.<br>• Pursuant to FERC's SPD issued September 19, 2023, GLHA will perform a fish assemblage survey at the Ripogenus Project in the spring of 2024 (likely late May or early June pending suitable field conditions).<br>• Data collected during the spring of 2024 will be provided in a USR supplement. | None. |
| 4 | Fish Stranding Study | • Study completed as required in 2022 with study results provided in the ISR.<br>• Additional information specific to the Fish Stranding Mitigation Study and the McKay Station Ramping Study is provided below. | None. |
| 5 | North Twin Impoundment Tributary Access Survey | Pursuant to the RSP and SPD:<br>• Based on the consultation with MDIFW, tributary surveys were performed in mid-July 2022, but the fall 2022 survey could not be performed due to wet weather and high impoundment elevations.<br>• The fall tributary survey is anticipated to be performed in early November 2023, pending suitable field conditions.<br>• Data collected in 2023 will be provided in the USR. | None. |

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|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 6 | Upstream American Eel Passage Assessment Study | • First season study activities were completed as required in 2022 with study results provided in the ISR.<br>• Based on comments received during the ISR Meeting and the FERC SPD issued on September 19, 2023, GLHA performed nighttime eel observations and electrofishing surveys at the Dolby, Millinocket, North Twin, and Millinocket Lake Storage Developments.<br>• From mid-July through September 2023, approximately 5-7 nighttime eel observation events were conducted at each dam .<br>• In July/August 2023, one nighttime electrofishing survey was performed downstream of the Millinocket, North Twin, and Millinocket Lake Storage dams. Due to high water conditions throughout the late summer and fall, after consultation with USFWS, MDMR, PIN, and MDIFW, further attempts to conduct additional electrofishing surveys were suspended in October.<br>• Data collected in 2023 will be provided in the USR. | • Heavy precipitation and unit outages experienced during the summer of 2023 resulted in high flows in the rivers and spill conditions at the dams limiting the ability to perform nighttime eel observations and electrofishing surveys. Although there were fewer surveys than anticipated, the monitoring completed in 2023 allowed GLHA to gain a good understanding of juvenile American eel presence and behavior at the Penobscot Mills Project. |
| 7 | Desktop Downstream Eel Passage Route and Survival Study | Study completed as required in 2022 with study results provided in the ISR. | None. |

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|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 8 | Recreation Study | • Portions of the study were completed in 2022 with study results provided in the ISR.<br>• GLHA completed the following study activities in 2023:<br>o Recreation site inventory and assessment of the Dolby Development and Green Bridge Boat Launch recreation sites.<br>o Spot and calibration counts of recreation users at the Dolby Development and Green Bridge Boat Launch recreation sites from May through September 2023.<br>o Redeployment of recreation user surveys kiosks at Project recreation sites at the Ripogenus and Penobscot Mills Projects, which will remain available through March 2024.<br>• GLHA plans to convene a focus group to further assess the existing Project recreation sites.<br>• Data collected in 2023 and early 2024 will be provided in the USR. | None. |

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|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 9 | Whitewater Boating Assessment Study | • First season study activities were completed in 2022 with study results provided in the ISR.<br>• Per the September 19, 2023 SPD, GLHA is in the process of planning, in consultation with AW, AMC, and boating interests a Level 2 evaluation of the West Branch below Stone Dam.<br>• The Level 2 reconnaissance field study will likely be conducted in spring/summer of 2024.<br>• Data collected in 2023 will be provided in the USR. Data collected in 2024 will be provided in a USR addendum. | None. |
| 10 | Aesthetic Study | • Portions of the study were completed in 2022 with study results provided in the ISR.<br>• GLHA consulted with interested stakeholders to form an aesthetics focus group. A conference call and site visit to the Project area was performed with the focus group in October 2023 to evaluate various Key Observation Points.<br>• Data collected in 2023 will be provided in the USR. | None. |
| 11 | Historic Architectural Survey | • Study completed as required in 2022 with study results provided in the ISR.<br>• GLHA is in the process of reviewing and addressing comments provided by the Maine Historic Preservation Commission and will provide updated information, as appropriate, in the USR. | None. |
| 12 | Historical Operations Data Assessment Study | • Study completed as required in 2022 with study results provided in the ISR. | None. |

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|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 13 | Operations Model Study | • First season study activities were completed in 2022 with study results provided in the ISR.<br>• GLHA will be hosting an in-person, 2-day, Operations Model Technical Workshop for stakeholders on December 5-6, 2023.<br>• Subsequent to the Operations Model Technical Workshop, GLHA will provide stakeholders with a 60-day period for which to provide comments on the operations model and/or submit alternative operating scenarios to be evaluated by the model.<br>• Information presented at the technical conference, stakeholder comments, and the results of the model runs for the requested alternative operating scenarios will be provided in the USR. | None. |
| 14 | Wood Turtle Habitat and Presence Evaluation Study | Consistent with the RSP and SPD:<br>• GLHA consulted with the MDIFW in early 2023.<br>• Based on the consultation with MDIFW, wood turtle habitat areas were identified and field surveyed in June 2023.<br>• No wood turtles were found during the field survey events performed in 2023.<br>• Data collected in 2023 will be provided in the USR. | None. |
| 15 | Marsh Bird Survey Study | Consistent with the RSP and SPD:<br>• GLHA consulted with the MDIFW in early 2023.<br>• Based on consultation with MDIFW, marsh bird habitat areas were identified and field surveyed between May 15 and June 30, 2023.<br>• Data collected in 2023 will be provided in the USR. | None. |

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|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 16 | Furbearer Survey Study | • During October 2023, GLHA consulted with MDIFW on proposed field study activities.<br>• From October 2-12, comprehensive furbearer surveys were performed throughout Ripogenus Impoundment and Umbazooksus Lake.<br>• Data collected in 2023 will be provided in the USR. | None. |
| 17 | Common Loon Management Plan Assessment Study | • The study was completed as required in 2022 with study results provided in the ISR. | None. |
| 18 | Riparian and Littoral Habitat Assessment Study | • First season study activities were completed in 2022 with study results provided in the ISR.<br>• Results from additional study activities as required by the September 19, 2023 SPD will be provided in the USR. | None. |
| 19 | Terrestrial, Botanical and Wildlife Resources Study | • The desk-top portion of the study was completed in 2022 with study results provided in the ISR.<br>• GLHA completed the study field activities in mid-August 2023.<br>• Data collected in 2023 will provided in the USR. | None. |
| 20 | Environmental Justice Study | Portions of the study were completed in 2022 with study results provided in the ISR.<br>• GLHA updated the study results per the September 19, 2023 FERC SPD.<br>• GLHA is in the process of performing consultation with the PIN as well as additional outreach to members of identified EJ communities.<br>• Data collected in 2023 will be provided in the USR. | None. |

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|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 21 | USGS Gage Feasibility Study | • GLHA will complete the study as required in consultation with the MDIFW and USGS with results anticipated to be provided in the USR. | None. |
| 22 | McKay Station Ramping Study | • In early September 2023, GLHA consulted with MDIFW to identify the window of time in which the study could be performed in consideration of the fish spawning season. MDIFW indicated the study should be performed after September 30 but prior to October 15, 2023. Due to the high precipitation events, in combination with the scheduled maintenance activities at McKay Station, which resulted in one or more turbine units were unavailable from early September through October 2023, GLHA was not able to perform the field activities during the designated time period. GLHA has notified the parties that requested the study of this schedule update.<br>• GLHA will consult with MDIFW to determine the timeframe to perform the study in 2024 and will consult with MDIFW and TU on the schedule and methods for the study field activities.<br>• Subsequent to completion of the required study activities, GLHA will file the results with FERC. | None. |
| 23 | Fish Stranding Mitigation Evaluation Study | • GLHA will complete the required fish stranding mitigation evaluation study subsequent to the completion of the McKay Station Ramping Study and will file the results with FERC when available. | None. |

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|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 24 | Umbazooksus Lake Mitigation Evaluation Study | • GLHA performed the field activities for this study in early October 2023.<br>• GLHA will consult with MDIFW on the results of the field survey completed and the evaluation of impacts to wetlands associated with higher water surface elevations.<br>• Data collected in 2023 will be provided in the USR. | None. |
| 25 | Angler Flow Evaluation in West Branch below Stone Dam | • During the fall of 2023, GLHA consulted with stakeholders and performed study field activities on October 24-25, 2023 to evaluate angler flows in the West Branch below Stone Dam.<br>• Data collected in 2023 will be provided in the USR. | None. |

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1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

Kimberly D. Bose November 6, 2023
Secretary Federal
Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426 Via Electronic Filing

RE: Harrington Lake (P- 2634) and Ripogenus Hydroelectric Project (FERC No. 2572-133) Penobscot Mills Hydroelectric Project (FERC No. 2458-247) April 24, 2023 initial Study Report, Appendices A and B.

Dear Secretary Bose,

The Operational Model Study Report included an analysis of Harrington Lake and its contribution of storage to the above referenced projects. The reference to Harrington Lake and store and released operations revealed a glitch in the 2004 Licensing of the Storage Project (P-2634). This filing seeks to migrate this error by requesting that Great Lakes Hydro America (Licensee), US Fish and Wildlife Service, Maine Department of Fisheries and Wildlife and/ or FERC act together or independently to provide fish passage from Duck Brook into Harrington Lake. As explained below this action is time critical.

Great Northern Paper Company (the former License holder) filed the Storage Project Application for a new License on April 28, 1998. That eventually included the abandonment of five unlicensed storage ponds. Harrington Lake was one of the five impoundments, and historical fish passage issues were eliminated by removal of existing gates.

> By letter dated July 10, 2000, GNE notified the Commission that it had ceased operations at Dole Pond, Long Pond, Harrington Lake, Penobscot Lake, and Loon Lake by removing the gates and associated lifting structures. GNE states that the outlet stream flows and pond water levels would fluctuate naturally with no impounding or flow management. Dole Pond and Long Pond were operated as store and release facilities.

During 2004 the Storage Project Licensing proceeding evolved into a Setl ement Process. The results of this event were the five unlicensed Storage Project facilities were included in the new license as environmental enhancement measures. Apart from Loon Lake, dam gates were replaced. The “unlicensed” projects became part of the new FERC Storage Project License. Operations reverted to a store and release, with targeted minimum flows, with the impoundment drawdowns around early November.

Historically Harrington Lake supported a Landlocked salmon (salmon) fishery that produced a high-quality fish supported by natural reproduction (wild fish). Recruitment of juvenile salmon was virtually entirely from Duck Brook (AKA Ripogenus Stream), the outlet of

Harrigton Lake. Under historical operation, the Harrington Facility was operated as “store and release”. Upstream fish passage was available once the gates were open and the lake drawn down occurred. Annual salmon recruitment was variable and dependent on downstream storage needs that resulted in early Harrington Lake drawdowns. With the 2004 License changes, “poor fish passage” has become no upstream fish passage. The November drawdown regime (after the biological active season) eliminated any reasonable hope of juvenile salmon recruitment to Harrington Lake.

The old wooden Harrington Lake Dam was rebuilt in the 1980’s. As future fish passage needs were uncertain, the new dam was designed and built with a space for a fishway. This space can easily be retrofit ed as a traditional fishway. However, current fishery needs can be met by inserting a Steep Pass Fishway such as is used at nearby Nesowadenhunk Lake. While not an engineer, I believe that the Steep Pass Fishway is the least cost option and quickest method.

The lack of a Harrington Lake Fishway is the type of oversight that happens when well intended people rush to come to consensus. It is my hope that one or all the named parties can quickly resolve this issue. A salmon’s life cycle is five to six years, thus it will take time to reestablish the Harrington Lake/Duck Brook salmon population.

Thank you for the opportunity to bring at ention to this glitch to those involved in the current Licensing of the Ripogenus and Penobscot Mills Projects. Nothing in the above is intended to suggest any error or wrongdoing by any party.

Ed Spear

307 Mt Hope Ave.
Bangor, Me 04401
Email: edspear1@yahoo.com
Phone: 207-217-4288

CC; Alan Creamer
Randy Dorman
Tim Obrey
Julieanne Rossit

Kimberly D. Bose November 8, 2023
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426 Via Electronic Filing

RE: Ripogenus Hydroelectric Project (FERC No. 2572-133) Penobscot Mills Hydroelectric Project (FERC No. 2458-247) Notice of Operations Model Technical Workshop

Dear Secretary Bose,

Unfortunately, I will not be able to at end the Operation Model workshop. My questions and comments are provided in the text below. In my earlier filing I requested an independent peer-reviewed water management or operational study. HRC's Operations Model dated April 24, 2023, represents a great deal of work, doomed to failure as the result of flawed goals and data proved by the Licensee. Nothing I have reviewed has changed my opinion. In fact, the text and tables of Appendices A and B have reinforced the need for an independent study.

Beginning on October 8, 1977, and continuing into 2004 my primary task as a Great Northen Paper (GNP) fisheries biologist was the study of the fisheries and anglers of the West Branch of the Penobscot River drainage. I was tasked with data collection and report writing for the Big A, Ripogenus, Penobscot Mills and Storage Projects. It is unlikely that anyone has boated, waded, walked, or studied the history of these facilities more often. Regarding fish and aquatic communities relating to flow and impoundment elevations, I ask FERC to take these comments as expert testimony.

The 1996 Ripogenus and Penobscot Mills Projects FERC Licenses were based on a Water Management Plan that included Rule Curve operations. It appears that the present Licensee discarded this plan as it does not meet the current energy market driven peeking operations. The Operations Model is based on assumptions and facts not in evidence; with a designed end point that allows the continuation of market driven peaking energy production. However, the Operational Model's most obvious and major flaw is that it totally ignores Ripogenus Project Article

406, juvenile Landlocked salmon (salmon) production in the Holbrook Bypass channel (Bypass). This enhancement was designed to operate when McKay Station flows were in the 2500 cfs range. As McKay Station flows are reduced Bypass flows are also reduced. Beginning with flows in the 2000 cfs range, salmon habitat is reduced; by 1300 cfs juvenile salmon habitat is lost.

The History of Great Northen Paper Water Management

As generating and papermaking technology were improving in the 70s and oil prices rising, GNP became more aware of the need to maintain its year-long hydro-electric capabilities. Stone and Webster conducted the earliest storage studies. During the late 1980s Northrop, Devine and Tarbell (NDT) were tasked at looking at the (combined) Storage Project (four Licensed impoundments along with six[1] unlicensed facilities) and its contribution to the system wide water budget.

NDT started with the assumption that water held in the Storage Projects was only of value when Ripogenus was a full Pond (elevation 941.6). In a fisheries capacity, I at ended meetings and reviewed NDT drafts. The results revealed that on average the combined contribution of licensed and unlicensed storage impound was approximately 4-5 BCF and that the small acreage “unlicensed” impoundments had de minimis value. This led to abandonment of these small storage ponds related to “hydro” needs. During the Set lement Process of the Storage Project (P-2634), many of these small ponds were converted to meet environmental goals. The Licensee now takes advantage of storage at the time of winter gate setting, typically November 1st.

During the early 1990s and in conjunction with ongoing Storge Project Licensing and the Licensed Ripogenus and Penobscot Mills Project, GNP hired Nathen Burris a well known hydrologist (he developed a water management plan for Israel) from the University of Arizona. Professor Burris, using thirty years of flow and storage records developed a water management plan based on Rule Curve needs. This plan met Paper Mill production, environmental, and recreation needs. Professor Burris’s plan became the foundation of today’s FERC Licenses. As with much of flow, pond elevation, fisheries and aquatic communities, and boating needs, neither the agencies, NGOs, nor GNP foresaw market driven peaking operations.

[1] At that time the Umbazookas facility was operated as storage pond rather than a part of Ripogenus Project wetlands mitigation measures.

Both the NDT and Professor Burris studies were GNP work products. The Licensee certainly has copies of these reports and accompanying flow and elevation data. These data should have been included in the operational model. The Licensee should make these reports available.

Current inflow in the Ripogenus

As explained above five unlicensed storage ponds were abandoned as they simply provided de minimis benefits to downstream generation. However, as part of the 2004 Storage Project Set lement Agreement, abandoned facilities were modified to provide environment enhancements, wetlands, and streamflow augmentation. The threefold increase in wholesale energy prices has increased the Storage Project value proportionally. To paraphrase current Storage Project (P2634) licensee requirements;

1) During the spring runoff period, the lake will be filled or near full
2) After July 15, impoundments, when applicable, can be gradually drawndown
3) Various minimum flow requirements are mandated.

Balancing maintaining full pond elevations against instream flow needs is challenging. It appears that the Operations Model default goal was reducing spill and maintaining Storage Project impoundment elevation at the expense of stream flow.

General comments Appendix A

HCR's model appears set to avoid spillage events. Spillage reduces/eliminates recreational activity as well as generation (tailwater elevations). However, it should be noted that occasional spill events are "biologically favorable" as the river bot om is purged of "fines" and sediment.

As there is no other option, HDR model uses existing license required environment minimum/target flows. It appears from the verbiage that alternate minimum flows and target Lake elevations can be added/adjusted.

Appendix A: 5.1.1 Historic Operations Data Assessment Study. *The 1991 Water Use Plan (i.e., the licensee's proposed operation alternative) was developed prior*

*to issuance of the Projects' existing licenses and was the basis for the operational requirements included in the Projects' 1996 FERC Licenses. However, as compared to the Water Use Plan, the Projects' current operations are defined by the requirements of the Projects' licenses. Therefore, the 1991 Water Use Plan is not a "management plan" consistent with other management plans resulting from a relicensing proceeding. The one exception being that the Water Use Plan is used as the basis for determining recreational flows from McKay Station at the Ripogenus Project.*

The above is revisionist history. The 1991 Water Use Plan (WUP) and accompanying Rule Curve Operation became the foundation of the 1996 License. The WUP was viable to the agencies and FERC at that time and remains valid today. It is simply the Licensee's opinion that the "*Water Use Plan is not a "management plan" consistent with other management plans resulting from a relicensing proceeding."* The Licensee's desire to change operations to a market driven peaking mode conflicts with environmental, recreational and aesthetic requirements, thus the existing WUP must be defeated, and a new plan installed. The operational model is an at empt to justify the gross shift in power generation from relatively stable base flow to peaking needs.

5.4 Recent Hydrology and Effects on Project Conditions

"*GLHA calculated inflows to the Ripogenus Project based on outflows from the Ripogenus Project in relation to storage in the impoundment to determine water year type (i.e., dry, normal, wet) from 2001-2022 (Table 12). Outflows from the Ripogenus Project are estimated based on gate discharge curves and a calculation of flow through the powerhouse based on generation output. Additionally, the methods used to estimate outflows have varied over time since 2000 based on available technology, project ownership, and other factors. The results of the calculated inflows to the Ripogenus Project were also compared to the hydrology recorded at the U.S Geological Survey (USGS) Gage No. 01029500 located on the East Branch Penobscot River at Grindstone".*

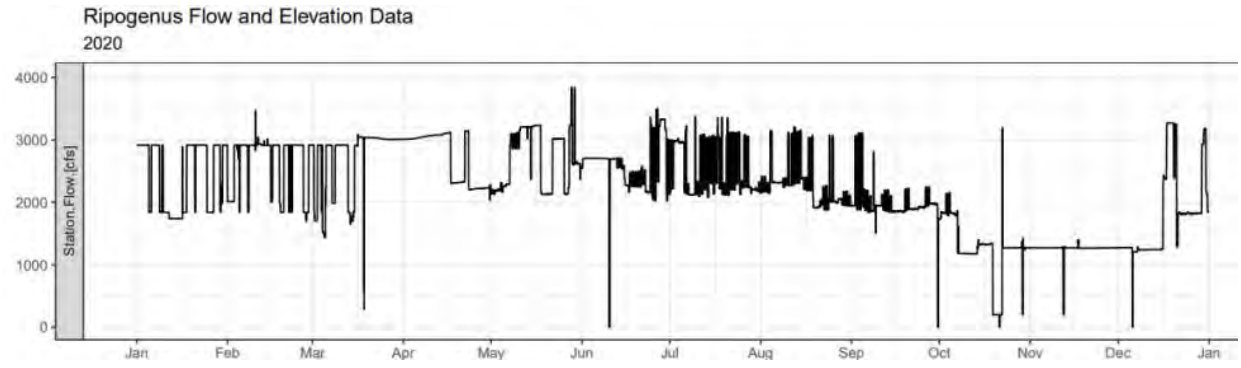
The report states *"Outflows from the Ripogenus Project are estimated based on gate discharge curves and a calculation of flow through the powerhouse based on generation output*. The North Branch begins at Big Bog where it flows westward and is joined by Dole Brook (two dams are located on Dole Brook). The Licensee

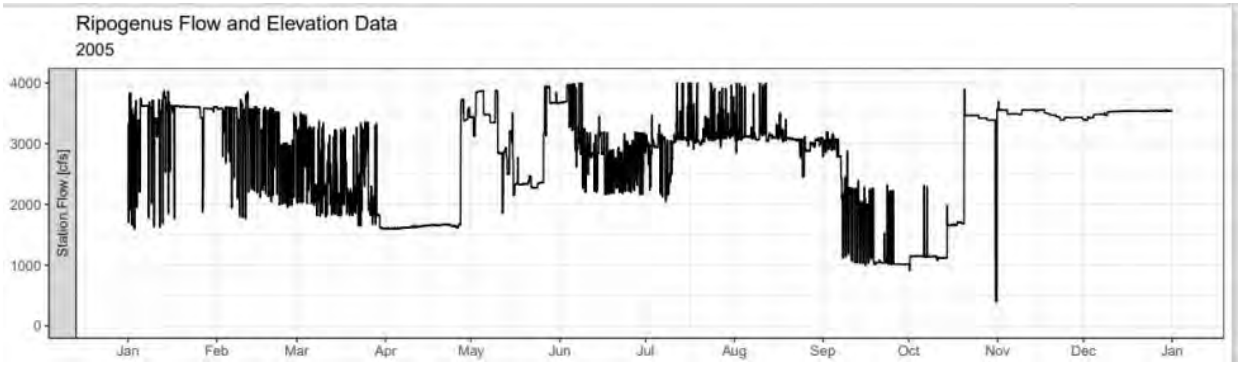
continually refuses to use the dam free North Branch USGS records. Moreover, according to the Licensee, HRC's use of USGS's Grindstone flow records that involve several Dams and the use of Allagash drainage (Lock Dam diversion of St John River water to the Penobscot) waters is Ok! There is no mention of the McKay outflow and Grindstone flows comparison other than the two driest years 2001(Grindstone) and 2022 (West Branch) differed. Perhaps a graphic presentation would be appropriate. The use of North Branch USGS records is even more appropriate.

5.5.3 Ripogenus Project
5.5.3.1 Project Operations

"The Ripogenus Project operates as a store-and-release development"

At best, this statement is misleading. In recent years the project has been operated in a peaking mode to meet market driven energy demands. The tables below are quite descriptive of McKay Station peaking operations.



Appendix A 32 Additionally, "*at times, flows from the Ripogenus Project are needed to maintain the required impoundment elevation at the North Twin Development when inflows (via tributaries or the Millinocket Lake Storage pump station) to the North Twin Development are less than the required minimum flows from the North Twin Development (i.e., approximately 2,000-3,000 cfs to meet the minimum flow requirements in the lower West Branch and mainstem Penobscot River for the protection of fisheries and aquatic habitat*)."

In general, the above statement is incorrect. The Penobscot Mills Project minimum flow is 2000 cfs (3000cfs August 22-Oct 15). Except for extreme drought, the combined "normal" McKay Station flows (2200 -2500 cfs), Millinocket Lake Pump Station, and tributary inflows are more than adequate to meet Licensed Penobscot Mills flow needs. The Licensee has complete control of Penobscot Mills flow. Should the Licensee continue their peaking operations, then low North Twin Impoundment elevations are their responsibility and not an excuse to drain the Ripogenus Impoundment. The West Branch reaches below McKay Station also require the "protection of fisheries and aquatic habitat."

Appendix A 60. *The spring runoff is used to replenish storage in the impoundments. Water is withdrawn at a controlled rate from the storage impoundments during the entire year to provide maximum sustained base-load energy in accordance with the system-wide rule curve, to provide storage capacity for the next spring, and to meet other constraints of the system*.

Unless the Licensee is violating the Storge Project (P-2634) License, this statement is incorrect. The Storage Pond License (see above excerpts) requires holding storage pond evaluations to at or near full pond until July 15$^{th}$ for shorebird nesting. Thus, there are no "controlled" or other drawdowns from the Storage Project until July 16$^{th}$.

"*Because the Projects operate as a system, there is no Project-specific rule curve for the Projects; rather the Projects are operated using a system-wide rule curve. The amount of available storage within the storage system is monitored continuously and operation of the entire system is adjusted, as necessary, to maintain overall storage conditions within proximity to the level indicated on the system-wide rule curve*."

The above statement is an at empt to set new storage and outflow "rules". The agencies and stakeholder's principal interests are Ripogenus impoundment elevation and outflows. When included in a system wide plan without drawdown restrictions, the Ripogenus Impoundment will continuously be responsible for meeting Penobscot Mills Project elevation and flow requirements. High North Twin Dam peaking outflows become an excuse to drain the Ripogenus Impoundment.

The above statement also is contradictory and an excellent example of "wordsmithing". The Licensee claims they do not use a rule curve, rather they use something **called "the system-wide rule curve." Other than the Licensee has shifted its use of "storage conditions", I** fail to see the difference. The Storage impoundments (P-2634) have not changed. New environmental constraints imposed by the (P-2634) 2004 Setl ement, change operations only marginally with the addition of five additional storage ponds.

General Comments Appendix B:

It appears that the Operations Model is set to produce impoundment elevation suitable for generation and to minimize spills. Minimum flows are only included when mandated by License conditions. This results in a drawdown regime that at times can reach a point where 1100 cfs (or 1000 cfs) flow is "allowed" e.g., September 17 - October 18 and prior to the November spawning season.[2]

4.1 Potential Reference Basins - HDR Engineering, Inc (HDR*) "development of a reference hydrograph for the Operations Model began with a compilation of the available USGS gages in the vicinity of the area of interest. …. only two gages are located directly inside the Ripogenus-Penobscot watershed". These two gages are located in the northeastern corner of the Ripogenus-Penobscot watershed (Figure 4-1) and both are regulated."*

The two referenced USGS Gages are on the North and South Branches of the Penobscot River. The Licensee is confused as to the location of its dams. There are no North Branch of the Penobscot River (North Branch) dams. However, there are Dole Brook dams below Dole and Long Ponds. The Dole Brook dams are in fact

[2] The License requirement to reduce flow from September 16 -October 15 to enhance the drawdown of the North Twin impoundment has been abandoned.

"regulated" by very small dams. The minimum flow at Dole Pond is 15 cfs, while the hydro control imposed by the Dole Pond Dam and subsequent "ponding" could delay downstream flow. Calling this system "regulated" seems extreme, and it is not in any sense material.

Instead of "working though" any constraints caused by two insignificant Dole Brook Dams, HDR evaluated other sites NOT representative of topographical, vegetative and climate conditions found in the West Branch region. The Seboeis drainage is also on the lee side of the Appalachian Mountain range while the West Branch drainage is on the windy side of the mountain. Kulik (1990)[3] examined various variables that influence rainfall and subsequent run-off. There is no indication that HRC considered these variables and other variables. The choice of Seboeis River is rather strange. The period of USGS record begins in 2018 and continues through the drought years and ends in 2022.

"*With the exception of the Millinocket Lake Storage Development (located on Millinocket Stream), all the Projects' developments are located on the West Branch."*

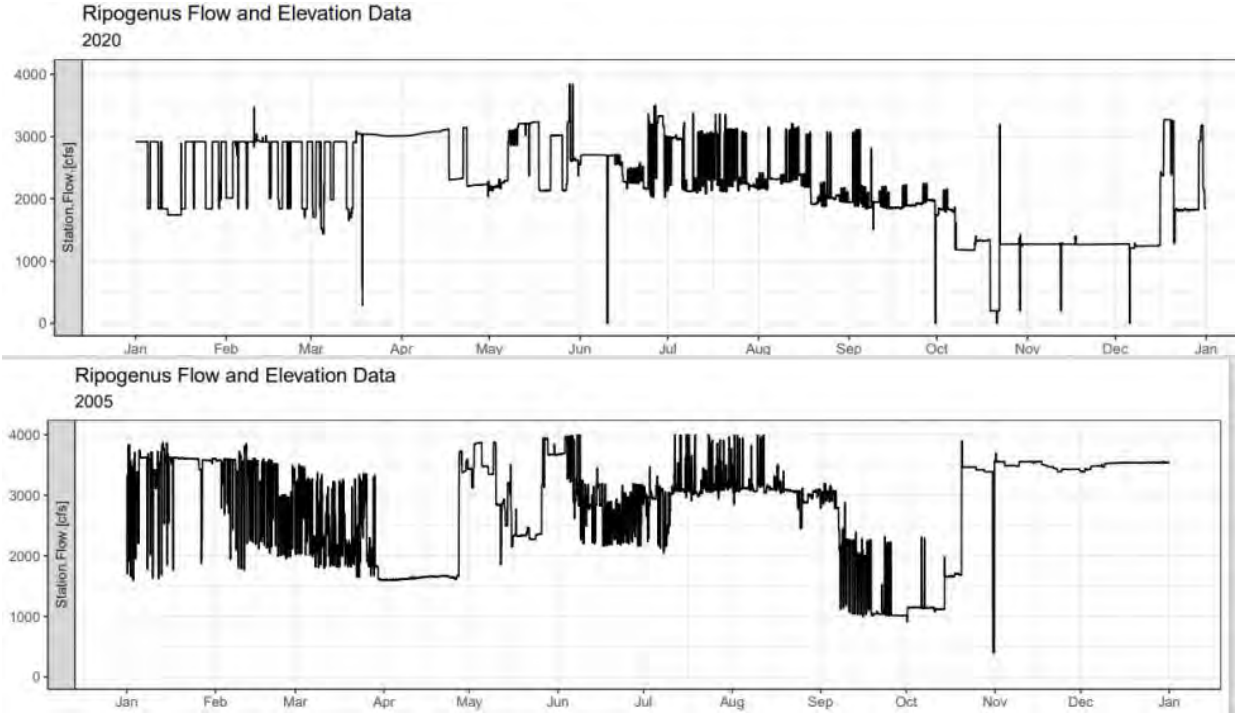
As a mat er of record, Millinocket Stream flows into the West Branch. The present confluence with the West Branch is at the Millinocket Facility. Historically, Millinocket Stream joined the West Branch just below Shad Pond and above the Dolby Impoundment.

System Setting
5.2.11 Load Shape - "*However, GLHA indicates that the System is currently operated on a store-and-release schedule where flow is more constant throughout the day*."

Despite the Licensee's position that nothing has changed in 25 years, HDR's own graphic presentation demonstrates peaking operation occurred daily during summer and early fall periods. While the Licensee's at empt to capture market driven energy prices is understandable, the failure to acknowledge and include

[3] Kulik, B. 1990. A method to Refine the New England Aquatic Base Flow Policy. Rivers, Vol. I, No. 1. Pp 8-22.

known frequent peaking events is a significant error. The Tables below from appendix A, (repeated here for convenience) are a graphic demonstration of McKay Station daily peaking events as well as outage flows.




"*The load shape defines the daily schedule of relative power demand using a duration in hours within each period in the peak, secondary-peak, and off-peak periods. To represent a typical generalized load shape, the peak period was defined as the period starting at hour 6:00 am lasting 16 consecutive hours*"

These sentences essentially describe peaking operations and not the "nothing has changed" stable base flows repeated in the Licensee's many filings. The logical conclusion is that the Operation Model is designed for extreme variation in daily flows resulting from peaking operations. Such flows are not environmentally friendly.

5.2.1.3 Forecast Set-Up Condition

"*The Operations Model Forecast Set-Up Condition requires two inputs: a number of forecast days and an accuracy of the forecast. The number of days is how many days the Operations Model can "look ahead" in the inflow hydrology file to calculate how much water the system is going to receive in the defined days ahead. The Baseline scenario was set up to look seven days ahead with 100*

*percent accuracy. By setting the Baseline scenario with a seven-day look ahead, the Operations Model will, as in real life, attempt to release more water ahead of high runoff periods, thus building usable storage to avoid or reduce spill."*

The inflow hydrology file seems to be based on historic hydrological conditions, rainfall, drought, etc. As these are variables, there must be some degree/percentage of certainty. The Licensee stated that the model could be "run" at 90% and 110% of forecasted seven-day conditions. This seems to be a narrow band as it is impossible to predict rainfall or lack of rainfall for a week In Maine's mountainous summer climate! The Licensee makes reference to "*release more water ahead of high runoff periods"*. The Ripogenus Impoundment is typically at or below 938ft before mid-April or after midmid-June and with 3-4 bcf of available storage, preemptive use of storage would seem unnecessary. While unstated, this goal appears to be related to Penobscot Mills Project's Impoundments.

Additionally, the model seems to focus on spill conditions, rather than low flow conditions. In many cases spill conditions are unavoidable. It is the stakeholder goal to avoid low flow events (less than 2200 cfs) that impact fish and aquatic communities as well as boating opportunities. The HDR model should be adjusted to allow for a guaranteed yearlong 2200 cfs McKay Station base flow that would be protective of fish and aquatic communities, Article 406 the Holbrook Bypass Channel salmon reproductive needs, as well as all recreationists.

5.2.2.5 Plant Operation. • Powerhouse Operation Type – *This condition specifies what type of scheduling logic is to be used for each powerhouse. The CHEOPS™ Daily Average Run-of-River plant logic was applied for the Ripogenus and North Twin developments as it best represents current operations.* ***This logic attempts to follow the simulated operational requirements without "peaking" within the day.*** *The peaking logic, if applied, would generate as much power as possible during the defined peak periods and reduce generation during off-peak periods to only equal required minimum flows, which does not reflect the current operations*.

As shown in the above Tables (Rip flow and elevation data 2022, 2005), the Licensee routinely operates in a peaking mode. Thus, by definition, the model logic is operating with a faulty assumption.

.5.2.3.2 Target and Minimum Elevations . *Ripogenus Project Table 5-5 show the target and minimum reservoir elevations simulated for the Operations Model for the Ripogenus Development. Target elevation data reflects the trend of the historical operations for years 2010 through 2021. Minimum elevation data is based on the target minimum elevation provided by GLHA*.

The Table below incorrectly starts with a Ripogenus Impoundment elevation of 939 ft. This is much below the Licensed full pond elevation of 941.69 ft. As a default, the model reduces the lake elevation by January. In effect, meeting the models elevation goals results in draining the Ripogenus Impoundment annually with West Branch outflow equaling inflow at some point in January. If this is not the case, where is the storage needed to provide minimum spawning and incubation flows after January 1st? Is the Licensee proposing to drawdown the impoundment to 913.6 ft annually? Great Northern Paper search of various regional databases found that January – March inflows would be in the 200 cfs range. Under this scenario, enhancement measures provided by Article 406 would be eliminated, and a river wide environmental disaster would result. Salmonid incubation, fish and aquatic communities would be devastated. Additionally, 2022 data should be included.

**Table 5-5. Ripogenus Development target elevation curve.**

| Date | Elevation (feet, NGVD 29) |
|---|---|
| **Target Elevations** | |
| Jan 1 | 928.6 |
| Mar 1 | 923.7 |
| Apr 1 | 921.6 |
| May 10 | 939 |
| Jul 1 | 939 |
| Oct 15 | 928.8 |
| Dec 31 | 928.6 |
| **Target Minimum Elevations** | |
| Jan 1 | 913.6 |
| Dec 31 | 913.6 |

As noted above Table 5.5 lists the Ripogenus target elevation at 939 ft. rather than the Licensed full pond elevation of 941.69ft. This obfuscation makes no sense as there are no Rip Dam over-topping issues, and other Licensee impoundments are brought to full pond at spring runoff. In this iteration the Licensee is at empting to hide almost 3 feet of elevation and 4 bcf of storage. To suggest that a competent hydro system operator such as Great Lake Hydro America would willingly lose 4 bcf of storage and the accompanying loss of head is insulting to the agencies, stakeholders and FERC staff. FERC should request that the Licensee require HDR to re-run all modeling using the historic and logical Ripogenus Impoundment full pond elevation of 941.69 ft.

VERIFICATION SCENARIO GRAPHICAL RESULTS - BASELINE SCENARIO GRAPHICAL RESULTS

In order to produce the graphic material shown in At achments One and Three, HDR must have the Licensee's historical flow, elevation, and gate change records for the four licensed ponds and the five additional storage ponds included in the 2004 Storage Project Setl ement process. These data should be made available to the agencies, stakeholders and FERC staff.

While most modeling events for the referenced period extended into 2022, the 2021 and 2022 modeling scenarios are strangely missing in the graphical results presented in At achments One and Three. All parties involved are aware that these were "dry years". Graphical results depicting drought years would demonstrate the model's validity or project its weakness.

Some graphical presentations need scale modification for readability, the 200 or 500 cfs scales makes it difficult to determine if some of the lower minimum flow requirements are being met. Various model outputs appear to account for McKay Station 1000 cfs minimum flow and 1422 cfs spawning and incubation flow requirements. However, providing flows necessary to meet Article 406 flow requirements was sporadic and apparently by chance. Provisions for Storage elevation requirements are included but when there are competing uses involved, elevation versus flow, it appears that shoreline nesting requirements (though July 15) outweigh fisheries and aquatic communities' requirements.

If my understanding is correct, there are no April empirical inflow data for Storage Projects impoundments, as access is remote. This glitch is understandable. Dam gates cannot be lower if vehicle access is blocked by the snow pack. Thus, HDR was left to simulate April and early May Storage Project inflows. The accuracy of April flows and elevation in remote storage projects is questionable. The initial April flow and elevation drives HDR's model in many cases. This is another example of the need to use USGS North Branch flow records (typical available in early April)

The Figures in At achment One and Three are strikingly similar. Summer outlet flows were typically lower than those set in the Storage Project Set lement Agreement. Ragged stream and Duck Brook (AKA Ripogenus stream), the outlet of Harrington Lake, both provide major salmon spawning and nursey habitat. These are the Storage Project impoundments outlets most often subject to low flows in simulations. Under the Operations Model's output critical juvenile salmonid production is lost.

8.0 Summary

*"The Operations Model was developed based on information available at the time of this report."*

Data from the drought years of 2020-2022 is missing in many instances. The failure to use USGS North Branch flow records is disturbing. There are many faulty assumptions. Thus, the above statement is simply the Licensee's opinion.

<u>Summary of requests needed to correct the Operations Model</u>

The above discussion provides proof that an independent peer-reviewed water management is needed. HDR cannot be faulted for following the Licensee instructions and alternately cannot be expected to act independently.

Should FERC decide that an independent water management plan/operation model is not needed, the Licensee needs to request HDR to:

1) Run modeling exercises with McKay Station in a Peaking mode, then repeat the modeling with the inclusion of downstream facilities
2) Use the historical Ripogenus full pond elevation of 941.69 **ft in all modeling**

**3) HRC use of 2020-2022 "drought years" data is sporadic. HDR states that a 23-year data set is used. These 2020-2022 low participation data should be included in all analysis. The absence of 2020-2022 data artificially increases low elevation records favorable to tabular values e.g., annual winter Ripogenus Impoundment elevations would be significantly lower had 2020-22 draught years been included.**
**4) Confirm the lack of dams on the North Branch and revisit the development of instream flows in the West Branch drainage system with a focus on the North Branch USGS gauging Station.**
**5) Disconnect McKay Station and West Branch flows from North Twin Project flow and elevation needs. The Ripogenus system should not have to mitigate for downstream energy market driven excessive (North Twin Impoundment) drawdowns.**
**6) Provide the agencies and stakeholder tabular information on Storage Project impoundment flow, elevation and gate changes.**
**7) Include the historic Great Northen Paper Water Use Plan data (1970-1999) along with the NDT and Burris reports.**
**8) November-April flows below McKay Station do not appear to be correlated to (low) winter Ripogenus Impoundment elevations and the lack of inflow. The apparent lack of outflow needs to be addressed.**

**Thank you for the opportunity to comment and suggest major changes. An unbiased and functional Operations Model is needed to balance and give equal consideration to competing uses.**

**Edward Spear**

307 Mt Hope Ave.
Bangor, ME 04401
Email: edspear1@yahoo.com
Phone (207) 217-4288

November 9, 2023

Ms. Kimberly D. Bose
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Via online submission to: http://www/ferc.gov**

Subject: **Special Request Regarding Concerns of Maine Council of Trout Unlimited with Respect to the Determination on Requests for Study Modifications and New Studies for the Ripogenus and Penobscot Mills Hydroelectric Projects (P-2572 and P-2458)**

Dear Secretary Bose:

On behalf of its six chapters and over 2,000 members, Maine Council of Trout Unlimited (TU) submits our concerns regarding the FERC Determination on Requests for Study Modifications and New Studies for the Ripogenus and Penobscot Mills Hydroelectric Projects dated September 19, 2023. While the Integrated Study Process does not provide for comments at this juncture, we respectfully ask that the Commission provide additional guidance to Brookfield based on the requests TU details in this letter. On its present course, the projects will remain uniformed in key areas until late in the process or (worst case) not provided making any determination of new terms and conditions for future projects arbitrary.

**Background**

The project Pre-application Document (PAD) stated that "GLHA maintains that a full suite of new studies is not needed, that the vast body of information on which today's certifications and licenses are soundly based and should be relied upon for these relicensings."[1] The nongovernment organization (NGO) stakeholders took exception to this statement stating "Brookfield is required to provide FERC with information in the PAD and PSP referencing either relevant and recent existing studies or proposing new studies that address a number of subject areas including: Fish and Aquatic Resources, Recreation and Land Use, Aesthetic Resources and Tribal Resources. Instead, Brookfield relies on dated, unavailable, or non-existent studies or directs stakeholders to search for the information themselves at other agencies or on the Internet."[2] The Study Plan Determination recommended 20 studies.[3] The Initial study Report Meeting and stakeholder comments followed as did FERC ISR Comments.[4] Brookfield subsequently submitted its Responses to Comments on the Initial Study Report and Requests for New or Amended Studies.[5] FERC approved additional studies and study modifications but did not provide guidance on the Historical Ops Data Assessment Study and the Ops Model Study.[6] TU's specific concerns are

[1] Ripogenus Hydroelectric Project (FERC No. 2572) Penobscot Mills Hydroelectric Project (FERC No. 2458) Notices of Intent to File License Application and Pre-Application Document dated June 11, 2021, page 1-11.
[2] NGO letter dated February 10, 2022, Subject: Preliminary Comments on the Proposed Study Plan (PSP) for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458).
[3] Study Plan Determination for the Ripogenus Hydroelectric Project and the Penobscot Mills Hydroelectric Project dated May 13, 2022, page 20.
[4] Staff Comments on the Initial Study Report and Initial Study Report Meeting Summary dated July 6, 2023.
[5] Brookfield Responses to Comments on the Initial Study Report and Requests for New or Amended Studies dated August 7, 2023.
[6] FERC Determination on Requests for Study Modifications and New Studies for the Ripogenus and Penobscot Mills Hydroelectric Projects dated September 19, 2023.

stated/restated in the paragraphs that follow. These also bear on the Ops Model Technical Workshop that Brookfield has scheduled for December 5 and 6.

**Key Issues**

The object of the study phase of the relicensing process is to obtain a baseline of current information based on the best science available upon which to base relicensing decisions later in the process. On the current course, significant concerns stand to delay or defeat this objective.

The December 5 and 6 Operations Model Technical Workshop[7] should be to inform stakeholders as to the current information that will form the basis of future discussion. Brookfield announced that the workshop would be held "***in person***" in Millinocket despite the fact that a number of the stakeholders: "would like to see the workshop moved to Bangor and supported by teleconference for those who can't be there in person. This includes USFWS, NOAA, BPL, TU, American Whitewater, Appalachian Mountain Club, Chesuncook Camp Owners Assn., Ed Spear and Sarah Sindo. This is a significant percentage of possible participants. We think that this would encourage stakeholder participation and be the best and most workable for all concerned: Brookfield, contractors, agencies, NGOs and individuals."[8] We have included the text of my November 1, 2023 email as Attachment A. American Rivers has since expressed its support of this as well. Brookfield has not responded, and TU still sees no reason or justification to hold the meeting "***in person***" in Millinocket as this will discourage stakeholder attendance, and holding it without a teleconference option will discourage participation. This will only serve to delay provision of information and make resolution of critical terms and conditions of the new license more problematic that it already promises to be. **TU asks that the workshop be held in Bangor and teleconferencing be provided using state-of-the-art teleconferencing technology.**

The announcement states that "The purpose of the workshop is to further explain the model inputs, calibration, and verification." When TU asked at the ISR Meeting how the low water levels of Ripogenus Lake occurred in two back-to-back years, the Brookfield response was that they were dry years and they were following the Ops Model. A key part of using the Ops Model is the monthly targets that are input. These are the ones that Brookfield uses. How target flows were determined was not explained and TU asked that information be provided in its ISR Comments.[9] Since we do not see this being specifically addressed in the workshop agenda, **TU asks that the basis for the monthly target lake levels be explained in detail at the workshop.**

**Table 5-5. Ripogenus Development target elevation curve.**

| Date | Elevation (feet, NGVD 29) |
|---|---|
| **Target Elevations** | |
| Jan 1 | 928.6 |
| Mar 1 | 923.7 |
| Apr 1 | 921.6 |
| May 10 | 939 |
| Jul 1 | 939 |
| Oct 15 | 928.8 |
| Dec 31 | 928.6 |
| **Target Minimum Elevations** | |
| Jan 1 | 913.6 |
| Dec 31 | 913.6 |

[7] Ripogenus Hydroelectric Project (FERC No. 2572-133), Penobscot Mills Hydroelectric Project (FERC No. 2458-247) Notice of Operations Model Technical Workshop dates October 26, 2023.
[8] Email from Steve Heinz to Randy Dorman of November 1, 2023, Re: Ripogenus & Penobscot Mills Hydroelectric Projects: Notice of Operations Model Workshop.
[9] Maine TU Council ISR Comments dated July 5, 2023, page 11.

TU asked for explanations of differences in operations over the winters of 202 and 2021 compared with those of the subsequent winter that filled Ripogenus-Chesuncook Lake. American Whitewater asked for specific Ops Model runs.[10] This will be nearly six months ago by the time the workshop is held. **TU asks that these model runs be presented and explained on the afternoon of day two of the workshop, or at least used as examples when explaining the workings of the ops model.**

Further review of the record by TU did not find a copy of the current water management plan that attaches to the current license. **TU asks that a copy of the Water Management Plan be provided at the workshop and its relationship to the current Ops Model be explained.**

Other specific concerns are detailed below.

**Specific Concerns**

<u>Historical Ops Model Study</u>.

1. FERC commented on what was presented at the ISR Meeting: "The results of the Historic Operations Study were presented during the ISR meeting. The presentation included graphical representations of lake levels and flows through the Ripogenus and Penobscot Mills Projects' developments. GLHA filed the operations data in electronic format on May 22, 2023, along with the ISR Meeting Summary. To assist us and other stakeholders in comparing actual operational releases to the licensed releases, as well as better understanding the details of how the projects are operated, please revise the excel spreadsheets for each of the projects' developments to correlate the historical hourly flow data with the licensed flow requirements at the time."[11]

| DateTime.[EST] | Station.Flow.[cfs] | NonStation.Flow.[cfs] | Impoundment.El.[ft] |
|---|---|---|---|
| 2000-01-01 00:00:00 | 3495 | 495 | 336.04 |
| 2000-01-01 01:00:00 | 3481 | 495 | 336.04 |
| 2000-01-01 02:00:00 | 3507 | 494 | 336.01 |
| 2000-01-01 03:00:00 | 3726 | 492 | 335.97 |
| 2000-01-01 04:00:00 | 3481 | 490 | 335.92 |
| 2000-01-01 05:00:00 | 3101 | 489 | 335.88 |
| 2000-01-01 06:00:00 | 3041 | 489 | 335.87 |
| 2000-01-01 07:00:00 | 3166 | 49 | 335.9 |
| 2000-01-01 08:00:00 | 3184 | 49 | 335.94 |
| 2000-01-01 09:00:00 | 3320 | 493 | 335.99 |
| 2000-01-01 10:00:00 | 3983 | 4 | 336.02 |
| 2000-01-01 11:00:00 | 4001 | 495 | 336.03 |
| 2000-01-01 12:00:00 | 3986 | 495 | 336.04 |
| 2000-01-01 13:00:00 | 3968 | 496 | 336.05 |
| 2000-01-01 14:00:00 | 3 76 | 496 | 336.06 |
| 2000-01-01 15:00:00 | 3 58 | 496 | 336.06 |
| 2000-01-01 16:00:00 | 39 | 496 | 336.06 |
| 2000-01-01 17:00:00 | 3 64 | 496 | 336.06 |
| 2000-01-01 18:00:00 | 951 | 496 | 336.05 |
| 2000-01-01 19:00:00 | 3936 | 495 | 336.04 |
| 2000-01-01 20:00:00 | 3942 | 495 | 336.04 |
| 2000-01-01 21:00:00 | 3956 | 495 | 336.02 |
| 2000-01-01 22:00:00 | 3949 | 494 | 336.02 |

SAMPLE

Brookfield responded: "GLHA provided a detailed description and graphics of required Project operations in the Pre-Application Document (PAD) as well as the Initial Study Report (ISR)… GLHA believes that the Operations Model will be the appropriate tool to evaluate current and potential alternative operating scenarios in relation to water availability and allocation in support of issuing the new licenses."[12]

TU Comment: FERC did not comment on this in its FERC Determination on Requests for Study Modifications and New Studies. TU supports the FERC request. Correlating historical hourly flow data with licensed flow requirements on an hourly basis to provide additional clarity to what it has already presented to this point.

[10] American Whitewater and Appalachian Mountain Club Comments on Initial Study Report and Request for Further Study for the Ripogenus Hydroelectric Project (P- 2572) and Penobscot Mills Hydroelectric Project (P-2458) dated July 6, 2023, page 13 and subsequent.

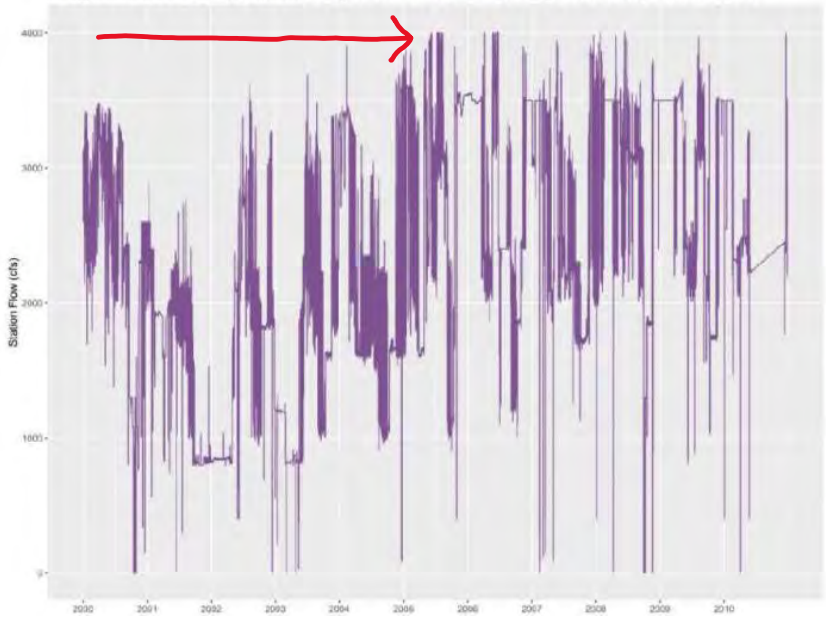
[11] Staff Comments on the Initial Study Report and Initial Study Report Meeting Summary dated July 6, 2023, page A-2.

[12] Brookfield Responses to Comments on the Initial Study Report and Requests for New or Amended Studies dated August 7, 2023, page B-1.

TU Request: **That Brookfield provide graphical representations of lake levels and flows as well as historical flow data as Excel Spreadsheets per the FERC request at the workshop.**

2. TU Comment: "The figures showing hourly McKay Station flows based on generation data show flows of 4000 cfs, especially Figure 12 below. These exceed the 3500 cfs hydraulic capacity of McKay Station [Pre-application Document dated June 11, 2021, page 4-14.] When queried at the ISR Meeting, the Brookfield response was the flows were not completely accurate and a range of variability was not available. This continues to cast doubt on the results of the analysis."[13] Further analysis indicates that the figure is even more misleading than TU originally thought because the upper limits of the hourly flow values appear to be truncated at 4000 cfs and are actually worse than the graph provided depicts. Brookfield goes on to validate the ops model using circular logic that is not valid. TU submits that while Brookfield was the organization that proposed both the Historical Ops Model Study and the Ops Model Studies as replacements for studies requested by NOAA fisheries, Brookfield has not justified this replacement. Additional rationale for this conclusion is provided in subsequent paragraphs.

**Figure 12. Estimated hourly flows from McKay Station, 2000-2010**




Brookfield Response: Includes the statements "… the Projects' existing licenses do not require the maintenance of flow data (e.g., for the past 20 years), and hence, the development of the requested historical data set has been both a labor-intensive activity, as well as dependent upon available data, which appears to include some anomalies or outliers. "Also, "In addition, GLHA notes that the observations associated with the comments (i.e., flows greater than 3,500 cfs) appear to be limited to the data between 2004 and 2013."[14]

TU Reply: The first statement is immaterial. Since Brookfield proposed the studies, Brookfield should have the data to defend them. If the observations associated with comments that are obviously incorrect didn't persist, then why were they used?

TU Request: **That Brookfield provide a rational explanation of why the hourly flow estimates at Ripogenus are so obviously at the workshop.**

Ops Model Study

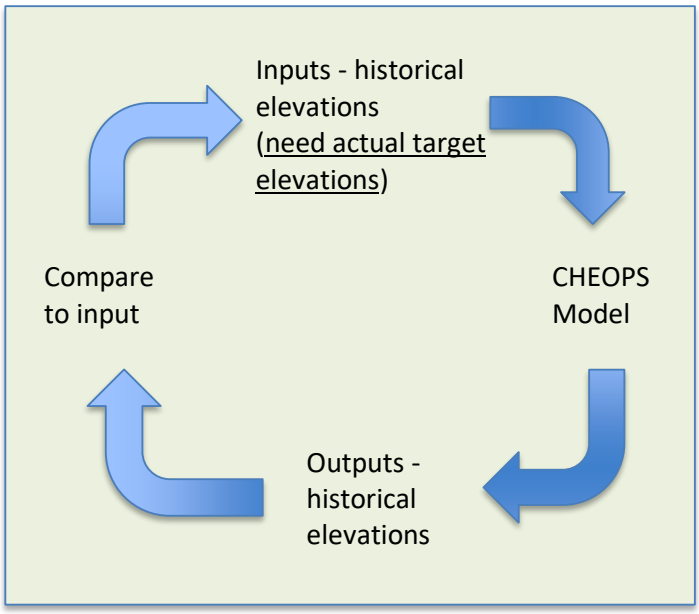
1. FERC Comment: "During the ISR meeting, and as documented in the ISR Meeting Summary, Maine TU raised concerns regarding the results of the validation run of the Operations Model. Maine TU indicates that, for the calendar year 2020, the modeled results do not line up well with the actual reported impoundment levels and releases for the Ripogenus Project. To address concerns about the CHEOPS

[13] Maine TU Council ISR Comments dated July 5, 2023, Appendix A.
[14] Brookfield Response to Comments on the Initial Study Report and New Study Requests, page Appendix B-32.

model and to improve the outcome of the second year of the study, which involves developing alternative operating scenarios to model, GLHA raised and the group discussed the concept of GLHA establishing a working group for the operations modeling. Establishing a working group could be beneficial to this process. If such a group is established, a technical work session could be convened to familiarize the members of the working group with the CHEOPS model, including how it works, as well as the models' assumptions and limitations. Such an approach could help to improve understanding of the model and ensure that all reasonable alternatives identified by stakeholders are modeled during the second year of studies."

Brookfield Response: "The Operations Model Study Report will be updated to include additional descriptions of the application of daily target elevations at the Ripogenus, North Twin, and Millinocket Lake Storage developments in the verification scenario as well as how the model utilizes target, spill and minimum elevation inputs during scenario execution. Additionally, expanded discussion will be added to the Operations Model Study Report to describe the simulated versus actual allocation of water between the Ripogenus and North Twin developments for the calendar year 2020 and 2021. GLHA is planning to convene an Operations Model Technical Conference with interested stakeholders to explain how the model was developed (including model inputs), how the model was calibrated and verified, how the model will be used in the relicensing process, and the framework for requesting alternative operating scenarios. GLHA anticipates conducting the technical conference in fall 2023. Subsequently, GLHA will evaluate reasonable alternative operating scenarios requested by stakeholders with results provided to stakeholders in early 2024 and filed with FERC in the USR by April 22, 2024."

TU Response: Operations models can be challenging to validate to historical data, especially when 1) trying to model a whole system of reservoirs as they are, and 2) the data needed to do this correctly likely does not exist. The most critical issue with their verification is the use of the "daily varying target elevations" for Ripogenus Lake and others. It appears that those "daily varying target elevations" are in fact historical elevations, and historical elevations were used as an input to the model, and then compared the output to those same elevations for verification.




To avoid this circle, actual target elevations must be used as the input. Those targets changed year to year (based on snowpack, forecast rain, etc.), but it appears that Brookfield did not document that. This would mean that there is no record of those historical targets and thus they cannot be used to verify the model. Brookfield specifically states that "(note for Ripogenus, North Twin, and Millinocket Lake Storage developments, the target elevation shown on the figures is the historical elevations).[15] (sic)

TU Request: That **Brookfield at least provide some example runs at the workshop from those requested by American Whitewater or TU demonstrating how daily varying target levels were determined.** The joint of

[15] Brookfield Responses to Comments on the Initial Study Report and Requests for New or Amended Studies dated August 7, 2023, page B-32.

American Whitewater and the Appalachian Mountain Club is included as Attachment D for convenience. Examples will have to be used to illustrate, why not use those requested months ago by stakeholders?

2. Brookfield Comments:" The Operations Model Study Report will be updated to include additional descriptions of the application of daily target elevations at the Ripogenus, North Twin, and Millinocket Lake Storage developments in the verification scenario as well as how the model utilizes target, spill and minimum elevation inputs."[16]

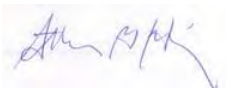
TU Response: **TU asks that discrepancies noted in its ISR comments[17] be addressed specifically at the workshop.**

**Summary of Request and Conclusion**

The Historical Ops Model Study and Ops Model Studies that Brookfield proposed to replace studies proposed by NOAA Fisheries failed to validate the Ops Model, and are therefore not credible. The workshop provides the opportunity for Brookfield to provide additional information to demonstrate that its conclusions are valid and these studies were appropriate replacements for those proposed by NOAA. Failing this, these studies have been shown to be works of sophistry rather than science.

Maine TU Council appreciates the Commission's attention to our requests regarding these important projects and hopes that the Commission will act to acquire the information needed to enable the Commission to balance project harms and benefits.

Respectfully,



Stephen G. Heinz
Maine TU Council FERC Coordinator

**Additional Distribution**:

Email copy to FERC Office of Public Participation

**Attachments:**

A - Email from Steve Heinz to Randy Dorman of November 1, 2023, Re: Ripogenus & Penobscot Mills Hydroelectric Projects: Notice of Operations Model Workshop.

B - TU ISR Comments, Appendix A: Historic Operations Data Assessment Study Comments

C - TU ISR Comments, Appendix B: Operations Model Study Comments

D - American Whitewater and Appalachian Mountain Club Comments on Initial Study Report and Request for Further Study for the Ripogenus Hydroelectric Project (P- 2572) and Penobscot Mills Hydroelectric Project (P-2458) dated July 6, 2023, pages 13 through 15

[16] Ibid.
[17] Maine TU Council ISR Comments dated July 5, 2023, Appendix B, pages 10 and 12.

# Attachment A

Dear Randy,

Stakeholders have been exchanging emails since Cate's announcement and a number of us would like to see the workshop moved to Bangor and supported by teleconference for those who can't be there in person. This includes USFWS, NOAA, BPL, TU, American Whitewater, Applachian Mountain Club, Chesuncook Camp Owners Assn., Ed Spear and Sarah Sindo. This is a significant percentage of possible participants. We think that this would encourage stakeholder participation and be the best and most workable for all concerned: Brookfield, contractors, agencies, NGOs and individuals.

TU uses a Meeting Owl to teleconference its Maine TU Council Meetings with great success.

Thank you for your consideration.

Respectfully,

Steve
781-4762

# Attachment B

## Appendix A

**Historic Operations Data Assessment Study**

**General Comments**

The study does not work with the Historic Operations Data Assessment Study and Operations Model Study to inform the relicensing as intended by the SPD:

> "GLHA would use the existing operations information, along with GLHA's proposed Water Quality Study, Historical Operations Data Assessment, and Operations Model, to assess the Projects' effects on the hydrology in the West Branch and mainstem Penobscot River [section 5.9(b)(4)" [SPD, page B-42].

The study does not provide details of why the Ripogenus-Chesuncook Impoundment was so severely dewatered during the summers of 2020 and 2021.

It should also be noted that the possible license violation reported by TU [TU letter dated May 12, 2022, Subject: Maine Council of Trout Unlimited Comments on the Minimum Flow Excursion Report dated April 28, 2022 for the Ripogenus Project (P-2572)] is still under active investigation by FERC Compliance: "Commission staff are actively working on this proceeding, and response has not yet been issued regarding this matter." [email Andrea Claros to Steve Heinz RE: Pending West Branch Possible License Violation dated June 8, 2023]

**Specific Comments**

Page A-1 The study does not effectively meet its objectives:

> "The goals and objectives of the study are to compile relevant historic operations data for the Projects to allow stakeholders to better understand historical operations of the Projects and associated water management objectives in support of the relicensing of the Projects."

The information contained in the ISR does not do that. How flows are managed for the Ripogenus Project remain unknown and explained by Brookfield as controlled by use of the CHEOPS model, a proprietary 'black box.' This cannot be used as rationale for avoiding informed discussion of how the projects are actually operated.

The study uses the term "waste flow" to label all non-station flows. This includes fishing flows of 100 cfs released using the sluiceway that are fishing flows. Another term should be used.

The study does not answer key questions: why was the Ripogenus-Chesuncook drawn so far down in both 2020 and 2021? Why are peaking operations being conducted as indicated by the attached study?

TU requests OPs Model runs documenting the inputs used to determine McKay Station flows including Ripogenus - Chesuncook Impoundment level elevation and a detailed description of the information used to determine the target impoundment levels:

1. October 16, 2019, December 20, 2019, March 4, 2020
2. October 16, 2020, December 20, 2020, March 4, 2021
3. October 16, 2021, December 20, 2021, March 4, 2022

October 16, 2021 was when Brookfield reduced spawning/incubation flows to 1100 cfs, March 4, 2022 was when they further reduced them to 800 cfs, December 20 is a rough mid-point. [Brookfield letter dated April 28, 2022, Ripogenus Project (FERC No. 2572-ME); Minimum Flow Excursion] The CHEOPS model alone cannot explain why in the first two timeframes, Brookfield made no effort to fill the reservoir while in the last timeframe it obviously did.

Page A-27 "Over the 23-year period, the Ripogenus impoundment was refilled to or near full pond elevation by late spring for 17 of the 23 years. The 6 years in which the impoundment elevation was not refilled to or near full pond elevation occurred during dry water years in 2001-2004, 2015-2016, and 2021 (Figures 7 and 8)." It is acknowledged that impoundment levels were unacceptably low during the summer of 2020 as well. Over time, it has become increasing difficult to refill the impoundment. A more aggressive approach to water management is needed. One was taken to full the reservoir over the winter of 2021 to 2022.

Page A-33 The figures showing hourly McKay Station flows based on generation data show flows of 4000 cfs, especially Figure 12 below. These exceed the 3500 cfs hydraulic capacity of McKay Station [Pre-application Document dated June 11, 2021, page 4-14. When queried at the ISR Meeting, the Brookfield response was the flows were not completely accurate and a range of variability was not available. This continues to cast doubt on the results of the analysis.

**Figure 12. Estimated hourly flows from McKay Station, 2000-2010**



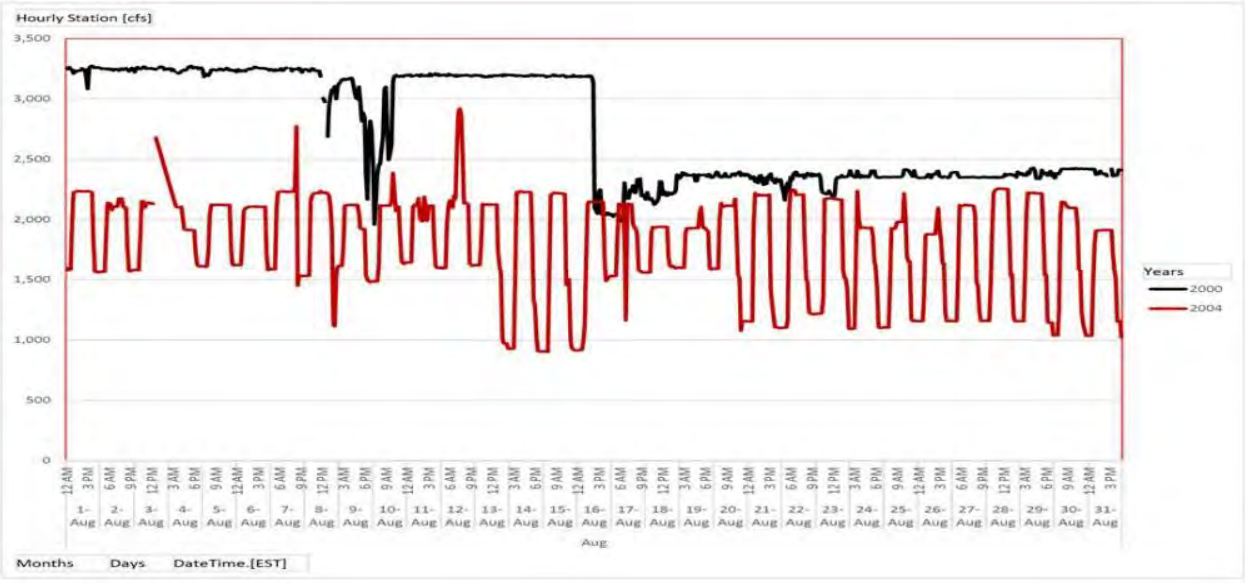
Page A-60 “The Ripogenus and Penobscot Mills Projects are operated as a combined system using the same system-wide rule curve as described above that has been used since the 1970s.” This does not explain how the Ripogenus-Chesuncook Impoundment was dewatered during the summers of 2020 and 2021 with any specificity, or aid in determining how this might be avoided in the future.

**Hourly Flow Data Comments**

The time delay between the request for the flow data and its submission by Brookfield underlines the need for a USGA flow gage and impoundment level gauge be installed for the Ripogenus Project. The flow gauge should be located immediately below Ripogenus Gorge in the Little Eddy vicinity.

It has been an open issue if project operations have changed since project ownership passed from Great Northern Paper. Increased peaking was reported by MDIFW in its PAD comments: “In addition, there is concern that the West Branch of the Penobscot River below McKay Station is managed as more of a peaking operation with flows exceeding 3,000 cfs during the day and 1,800 cfs or less in the evenings. Flow changes of this magnitude in a short period of time can dewater areas of the river and result in a loss of macroinvertebrate diversity and habitat, as well as cause direct mortality. MDIFW believes the summer drawdowns and peaking operations were not fully anticipated in the review of the current license and therefore the water management plan may need to be refined. This study, along with the requested lake elevation and flow data, will provide information about the degree, frequency, and possible impacts resulting from the drawdowns and changes in flow. [MDIFW letter October 8, 2021, Re: MDIFW Comments and Study Requests for the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458), pages 35 and 36.]

Brookfield provided hourly flow data requested by MDIFW and other agency filings with the ISR Meeting Report. A preliminary analysis of August and November data performed by the National Marine Fisheries Service indicated that operations have changed and that peaking is occurring. The following example



demonstrates this, many of the graphs making the comparison show 2000 flow patterns were more stable than subsequent years. This is consistent with what TU has been told through anecdotal reports.

Current studies confirm that such release practices affect both macro-invertebrate communities and fish. “The degree of hydropeaking, proximity of unregulated tributaries, and distance from the dam have been shown to have a large influence on the ultimate abundance and diversity of aquatic macroinvertebrates. [The ups and downs of hydropeaking: a Canadian perspective on the need for, and ecological costs of, peaking hydropower production, K. E. Smokorowski; Hydrobiologia (2022) 849:421–441, page 429.] “… hydropeaking operations do have negative effects on fish populations, particularly smaller bodied species or life stages, the ultimate effect on fish populations is determined by degree of hydropeaking…” [Id., page 431.] This is consistent with the results of the Stranding Study and underlines the need for a Ramping Study to determine optimal flow levels and ramping rate to achieve them to minimize or eliminate negative effects of flow changes.

TU also notes that it is well established that when flows change abruptly, fishing is disrupted for about an hour while fish readjust to the new flow. Peaking effectively takes two hours from a full fishing day, decreasing the recreational use of the resource. This is inconsistent with the world-class fishery described in the last license application for the Ripogenus Project.

# Attachment C

## Appendix B

**Operations Model Study**

**General Comments**

For the reasons explained below, the Operations Model Study does not satisfy FERC's rationale for the study: "GLHA would use the existing operations information, along with GLHA's proposed Water Quality Study, Historical Operations Data Assessment, and Operations Model, to assess the Projects' effects on the hydrology in the West Branch and mainstem Penobscot River [section 5.9(b)(4)" [SPD, page B-42].

**Specific Comments**

1. **The use of "Daily changing target elevations" (instead of the prescribed operational targets) at Ripogenus, North Twin, and Millinocket Lake Storage in the Verification scenario needs to be clearly defined, explained, and justified.**

   The report states that "Daily changing target reservoir elevations to simulate historical operations for the Ripogenus, North Twin, and Millinocket Lake developments." for the Verification scenario (page B-27). Only in the notes for Attachment 1 does the report clarify that "for Ripogenus, North Twin, and Millinocket Lake developments, the target elevation is the historical end of day elevation reported by GLHA from the historical operations in NGVD29."

   The clarification that the "Daily changing target reservoir elevations" refers to the "historical elevations" should be mentioned and more clearly explained within the body of the report and not in an appendix note. Without further explanation, we conclude that this decision was made to make the model simulations appear more accurate than they would have been should the actual operational targets have been used.

   Furthermore, historical elevations were only used at three of the developments, while the Baseline operational targets were used at all other developments. Why use historical elevations at some but not others? This inconsistency requires explanation.

   Lastly, because **historical** elevations were used instead of **target** elevations, the results for the Verification scenario do not support the conclusion that "the Operations Model compares well to historical data, characterizes system operations, and is appropriate for use in evaluating the effects of alternative operating scenarios on generation, reservoir levels, and outflows from the System" (page B-102). **Target elevation curves are one of the most important elements of reservoir operations. Excluding these targets from the Verification Scenario means the model was not in fact evaluated for its ability to characterize system operations, but for its ability to simulate historical conditions using those historical conditions as a primary input.** In other words, by using historical elevations as an input to the model and then concluding that the simulated output elevations are reasonably accurate compared to those same historical elevations is circular logic: the same proposition occurs as both a premise and a conclusion—the argument validates itself.

2. **The report concludes the model is verified based on historical elevations, but contains insufficient comparisons of historical and simulated reservoir elevations.**

The start of Section 6.1.1 states that "The Verification scenario established in the Operations Model followed the historical operating requirements of the System by simulating daily changing target elevations to match historic elevations, historical reported spillway flows, and unit outages to simulate historical daily turbine operations" (page B-92).

However, the report does not include any quantitative evaluation of model accuracy in terms of simulating reservoir elevations. Tables 6-1 through 6-5 and Table 6-6 provide bases for evaluating model accuracy for simulating power generation and release flows, respectively. A similar comparison is not provided for reservoir elevations.

Example: Table 6-1 McKay Station [ISR page B-94]

**Table 6-1. McKay Station Verification generation comparison.**

| Year | Historical Generation (MWh) | Simulated Generation (MWh) | Difference between Historical and Simulated (MWh) | Percent Difference between Historical and Simulated (%) |
|---|---|---|---|---|
| 2015 | 211,964 | 228,520 | 16,556 | 7.81% |
| 2016 | 218,799 | 221,628 | 2,829 | 1.29% |
| 2017 | 220,978 | 221,141 | 163 | 0.07% |
| 2018 | 242,539 | 238,860 | -3,679 | -1.52% |
| 2019 | 256,618 | 240,347 | -16,271 | -6.34% |
| 2020 | 229,420 | 238,917 | 9,497 | 4.14% |
| **Average** | **230,053** | **231,569** | **1,516** | **0.66%** |

**Presumably, the conclusion that the model was verified in terms of simulating historical elevations was based on the graphical comparisons in Attachment 1. However, none of those figures includes the historical elevation for comparison against the simulated elevation.** These figures only include the target and simulated elevations. Only the figures for Ripogenus, North Twin, and Millinocket Lake developments include the historical elevation, but only because the historical elevations were used in place of the target elevations. In other words, the figures for these developments may include the historical elevations, but they are labeled as "Target Elevation," which makes it challenging for the reader to make the comparison of historical vs simulated elevations.

**Figure Attachment 1-10. Verification simulated Ragged Lake operations 2015.**

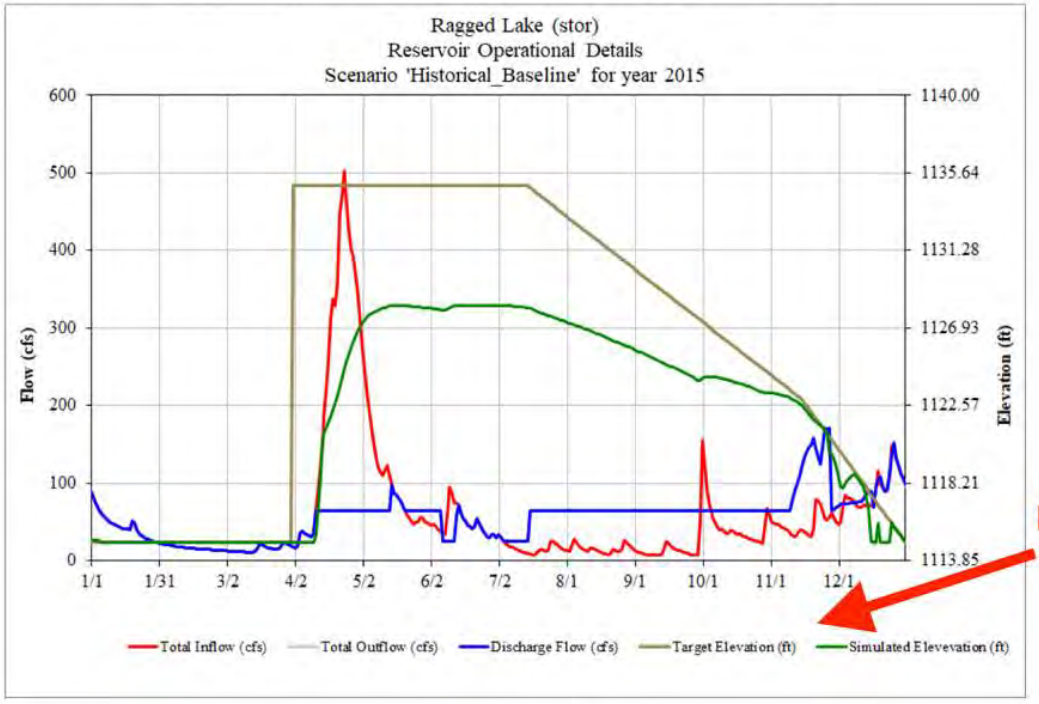
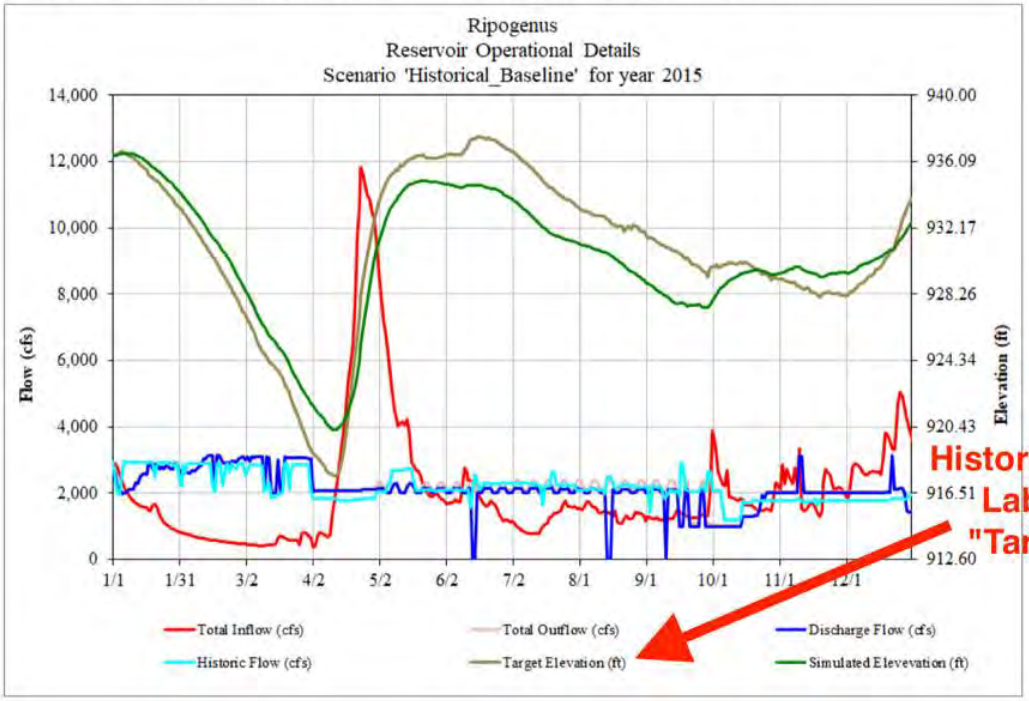



**Figure Attachment 1-11. Verification simulated Ripogenus operations 2015.**




To justify the conclusion that the model can simulate historical elevations in addition to power generation and release discharge, the report should include a quantitative comparison for reservoir elevations similar to Tables 6-1 through 6-6 and graphical comparisons that include both the historical and simulated elevations.

**3. The Operations Model Study fails to explain the derivation of the primary target elevations or why operations deviated from those targets in previous years, especially for the Ripogenus development.**

The report states that "At Ripogenus Dam, the impoundment water elevation is based on an annual rule curve that has prescribed weekly elevations that are used as a guideline to set the pond level based on the time of year. GLHA uses these elevations in conjunction with the storage available in the upstream storage ponds along with snowpack estimates in the winter months and forecasted precipitation to determine operations to maintain adherence to the rule curve" (page B-54). The target elevation curve is then provided in Table 5-5.

**Given the importance of these target elevations, a more detailed explanation for how these target elevations were identified is warranted.** For example, why lower the pool to 921.6 ft NGVD29 on April 1, why not 922 ft? What is the basis for 921.6 ft on April 1, as well as each of the other target elevations, orange highlighting supplied?

**Table 5-5. Ripogenus Development target elevation curve.**

| Date | Elevation (feet, NGVD 29) |
|---|---|
| **Target Elevations** | |
| Jan 1 | 928.6 |
| Mar 1 | 923.7 |
| Apr 1 | 921.6 |
| May 10 | 939 |
| Jul 1 | 939 |
| Oct 15 | 928.8 |
| Dec 31 | 928.6 |
| **Target Minimum Elevations** | |
| Jan 1 | 913.6 |
| Dec 31 | 913.6 |

Furthermore, the report does not discuss reasons for why the historical operations deviated from these targets. In some cases, notably in 2020 and 2021, the operational decisions that led to low reservoir levels in the Ripogenus had negative impacts on the shoreline community. Figure 1 below shows the Verification Scenario figures from Attachment 1 with the target rule curve superimposed (thick red line supplied). This figure clearly shows in what years and seasons the historical reservoir elevations deviated from the Baseline target, most notably in 2018 and 2020, areas of concern circled in orange for clarity.

**Figure Attachment 1-11. Verification simulated Ripogenus operations 2015.**

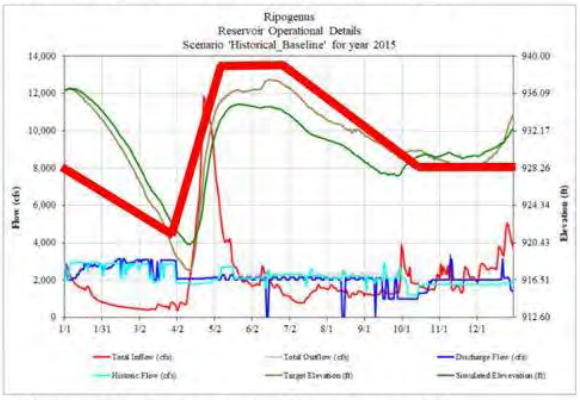



**Figure Attachment 1-29. Verification simulated Ripogenus operations 2016.**

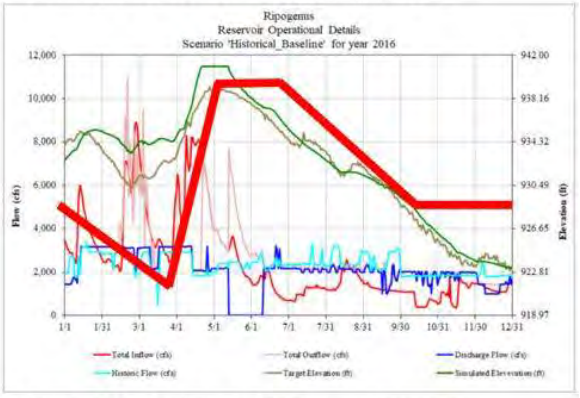



**Figure Attachment 1-47. Verification simulated Ripogenus operations 2017.**

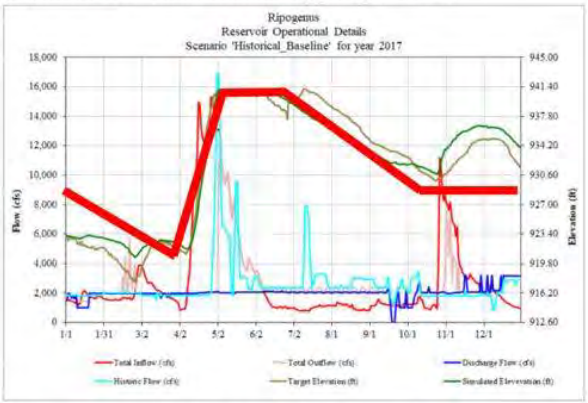



**Figure Attachment 1-65. Verification simulated Ripogenus operations 2018.**




**Figure Attachment 1-83. Verification simulated Ripogenus operations 2019.**

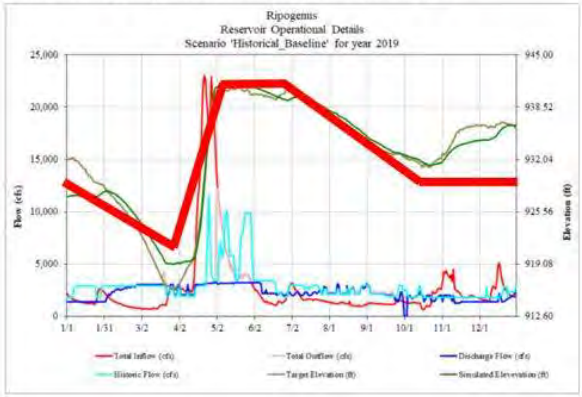
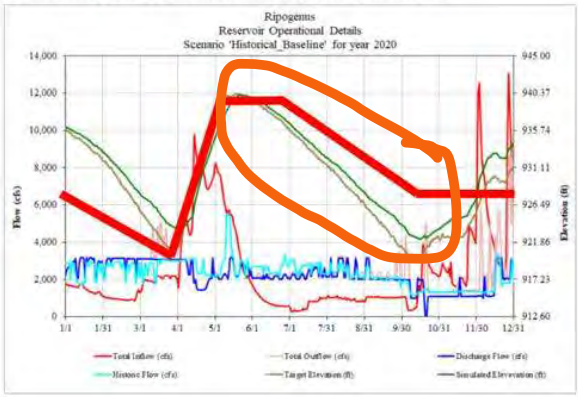



**Figure Attachment 1-101. Verification simulated Ripogenus operations 2020.**




**4. The Operations Model Study Report does not explain how this model will be used to develop and compare alternative operations.**

The report concludes that "the Operations Model…is appropriate for use in evaluating the effects of alternative operating scenarios on generation, reservoir levels, and outflows from the System" (page B-102).

It is not clear how those alternatives will be developed and evaluated. Given the historical negative impacts of the Ripogenus operations, especially in 2020-2021, the development and comparison of alternative operations is a critical component of the relicensing process in order to ensure the next license contains operational constraints to minimize those impacts.

**Summary of Requests**

TU requests that the Operations Model Study be resubmitted modified as described below as provided by (18 CFR 5.15(d)) paragraphs (c)(1)–(4) "(1) Approved studies were not conducted as provided for in the approved study plan;"

That the report include a clear **definition, explanation, and justification of using "Daily changing target elevations" at Ripogenus, North Twin, and Millinocket Lake Storage in the Verification Scenario**. This revision must explain how the use of historical elevations in place of target elevations at these developments supports the conclusion that the model "…compares well to historical data, characterizes system operations, and is appropriate for use in evaluating the effects of alternative operating scenarios on generation, reservoir levels, and outflows from the System" when it did not include a central component of the operational rules (namely the target elevations) in the Verification Scenario.

That the report **include quantitative (tabular) comparisons between historical and simulated reservoir elevations** for the Verification Scenario, and that **historical elevations be added and clearly labelled to the graphical comparisons in Attachment 1**.

That the report **explain: 1) the basis for the target elevations used for the Baseline Scenario (e.g., Table 5-5) and 2) reasons that historical operations led to major deviations from those target elevations** (e.g., late-summer draw down of Ripogenus in 2018 and 2020).

That Brookfield **specify the format required for requesting alternative target levels or other operational rules** to be simulated using the Operations Model. Note that such requests are NOT subject to the July 6 ISR Comment deadline.

At the ISR Meeting, "Randall Dorman (GLHA) said he anticipates that GLHA will convene a working group to develop alternative operating scenarios, and noted that alternatives should be based on study results and that stakeholders should be prepared to describe the reasoning behind any alternative request." [ISR Meeting Report, page 4]. Request that **details relating to the function of this group be published no later than with the Updated Study Report**. This would include: a plan and schedule detailing how this model will be used to evaluate alternative operating scenarios, who will participate in that process, and over what timeline.

# Attachment D

**Model Run #1**
**Upper Gorge Bypassed Reach Minimum Flow**

This model seeks to increase the minimum flow on the West Branch below Ripogenus Dam

| | Dates | Flow (cfs) released from Development | Remarks | Start Hour | End Hour |
|---|---|---|---|---|---|
| Current | 7/1-9/30<br>10/1-6/30 | 100 cfs<br>None (12 cfs) | Provide 100 cfs bypassed reach flow below Ripogenus Dam from sluiceway or other gate from 7/1-9/30 reduced to 12 cfs from 10/1-6/30 | 24 hours | - |
| Alternative | Year Round | 400 cfs | Provide continuous minimum flow of 400 cfs in bypassed reach below Ripogenus Dam to support aquatic habitat and recreation. Minimum flow would also augment flow in the event McKay Station outage, reducing stranding downstream | 24 hours | |

**Model Run #2**
**Upper Gorge Bypassed Reach Whitewater Releases**

This model run seeks to provide opportunities for scheduled whitewater releases in the Upper Gorge below Ripogenus Dam

| | Dates | Flow (cfs) released from Development | Remarks | Start Hour | End Hour |
|---|---|---|---|---|---|
| Current | None | None | No scheduled whitewater releases are currently required in the Upper Gorge | - | - |
| Alternative | 5/1-10/1 | 1000 cfs | Provide flow of 1000 cfs in the Upper Gorge below Ripogenus Dam for 4 hours one weekend day each week to support whitewater boating in the Upper Gorge and below McKay Station. Flow below McKay Station would remain unchanged from current license requirements. | 1000 | 1400 |

**Model Run #3**
**Millinocket Stream Flow Restoration**

This model run seeks to eliminate pumping from Millinocket Lake to North Twin.

| | Dates | Flow (cfs) released from Development | Remarks | Start Hour | End Hour |
|---|---|---|---|---|---|
| Current | Year Round | 60 cfs or inflow if less | Millinocket Stream inflows are pumped from Millinocket Lake to Ambajejus Lake by two pumps with a combined hydraulic capacity of 244 cfs..Millinocket Lake levels fluctuate 6.2 feet. | 24 hours | 24 hours |
| Alternative | Year Round | All inflow | Restore flows to Millinocket Stream by discharging all inflow from Millinocket Lake Dam, stabilizing lake levels and restoring natural flow regime. | 24 hours | 24 hours |

**Model Run #4**
**Millinocket Stream Whitewater Releases**

This model run seeks to provide opportunities for scheduled whitewater releases in Millinocket Stream

| | Dates | Flow (cfs) released from Development | Remarks | Start Hour | End Hour |
|---|---|---|---|---|---|
| Current | None | None | No scheduled whitewater releases are currently required from Millinocket Lake Dam into Millinocket Stream | - | - |
| Alternative | 6/1-10/1 | 600 cfs | Provide flow of 600 cfs from Millinocket Lake Dam into Millinocket Stream for 4 hours one weekend day each week to support whitewater boating on Millinocket Stream | 1000 | 1400 |

**Model Run #5**

**West Branch Below Stone Dam Minimum Flow**

This model run seeks to establish a minimum flow for the West Branch below Stone Dam

| | Dates | Flow (cfs) released from Development | Remarks | Start Hour | End Hour |
|---|---|---|---|---|---|
| Current | - | None (3 cfs) | Currently there is no minimum flow requirement on the West Branch below Stone Dam | - | - |
| Alternative | Year Round | 400 cfs | Restore flows to the West Branch below Stone Dam by discharging a continuous minimum flow of 400 cfs through new gate structure or powerhouse to benefit aquatic habitat and recreation | 24 hours | 24 hours |

**Model Run #6**

**West Branch Below Stone Dam Whitewater Releases**

This model run seeks to provide opportunities for scheduled whitewater releases in the West Branch below Stone Dam

| | Dates | Flow (cfs) released from Development | Remarks | Start Hour | End Hour |
|---|---|---|---|---|---|
| Current | None | None | No scheduled whitewater releases are currently required from Stone Dam into the West Branch | - | - |
| Alternative | 5/1-10/1 | 2300 cfs | Provide flow of 2300 cfs from Quakish Lake over Stone Dam for 4 hours one weekend day each week to support whitewater boating on the West Branch below Stone Dam | 1000 | 1400 |

Brookfield
Renewable U.S.

November 13, 2023

***Via eFiling***

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Updated Notice of Operations Model Technical Workshop**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), Licensee of the Ripogenus Hydroelectric Project (No. 2572) and the Penobscot Mills Hydroelectric Project (No. 2458) (collectively referred to as the "Projects"), herein is providing an updated notification of the date and location for the upcoming Operations Model Study Technical Workshop to be hosted by GLHA.

**Background**

On June 11, 2021, GLHA filed the Notices of Intent and a Pre-Application Document (PAD), which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through FERC's Integrated Licensing Process (ILP). On March 23, 2022, GLHA filed the Revised Study Plan (RSP), and on May 13, 2022, FERC issued the Study Plan Determination (SPD). Pursuant to the RSP and as approved and modified by FERC's SPD, GLHA performed first season study activities in 2022 with available results provided in the Initial Study Report (ISR) filed with FERC on April 24, 2023. Subsequent to filing the ISR, stakeholders filed comments on the ISR and new study requests, and on September 19, 2023, FERC issued the second SPD.

On October 26, 2023, GLHA filed a letter with FERC providing notification that GLHA would be hosting a 2-day, in-person Operations Model Technical Workshop on December 5-6, 2023 at GLHA's office located in Millinocket, Maine. To date, several stakeholders have expressed interest in attending the workshop, but requested that it be located in Bangor, Maine, for greater convenience for non-local attendees. No attendees to date have requested that the workshop be held in Millinocket. Additionally, representatives of the local whitewater boating community indicated that there is a national whitewater boating conference occurring the week of December 4, 2023, creating a conflict with the planned workshop dates of December 5-6, 2023.

Based on the requests for a modified meeting date and location and to allow for participation in the workshop by interested stakeholders, GLHA has modified the workshop date and location as further described below.

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

**Operations Model Technical Workshop**

Pursuant to the RSP and FERC-issued SPDs, GLHA developed an operations model designed to evaluate alternative operating scenarios in support of the ongoing relicensing of the Projects. During the May 2, 2023 ISR Meeting, GLHA described how the operations model was developed, calibrated, and verified.

Building off the information presented during the ISR Meeting, GLHA will be hosting a 2-day, ***in-person*** Operations Model Technical Workshop. The purpose of the workshop is to further explain the model inputs, calibration, and verification. During the workshop, GLHA will describe how the model is being used in support of the relicensing, how to request alternative operating scenarios, and how to interpret the model results. All stakeholders interested in learning more about the operations model are invited to attend this workshop.

The workshop will be held ***in-person*** at the **Maine Department of Environmnetal Protection (MDEP) Office located at 106 Hogan Road, Suite 6 (3rd Floor) in Bangor, Maine** over two consecutive days, on January 10 and 11, 2024.

In order to plan accordingly, GLHA respectfully requests stakeholders who plan on attending the workshop RSVP by contacting Cate Russell at Cate.Russell@hdrinc.com or (207) 239-3792 at your earliest convenience but no later than January 3, 2024.

The anticipated agenda for the workshop is provided below.

### Wednesday, January 10, 2024 (9:00 AM to 4:00 PM)

1. Logistics, Safety, and Introductions (9:00 – 9:15)
2. Meeting Purpose (9:15 – 9:30)
3. Relicensing Schedule (9:30 – 9:45)
4. Overview of Projects (9:45-10:30)
5. Overview of the Operations Model (10:30 – 12:00)
6. Lunch (12:00 – 1:00)
7. Model Hydrology (1:00 – 1:30)
8. Model Verification (1:30 – 2:00)
9. Overview of Model Interface and the Operations Baseline (2:00 – 4:00)

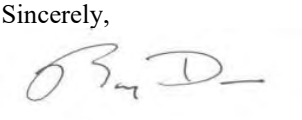
### Thursday, January 11, 2024 (9:00 AM to 12:00 PM)

1. Overview of Requests for Alternative Operating Scenarios (9:00-10:00)
2. Overview of Interpreting Model Run Results (10:00-12:00)

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

If you have any questions regarding this information, please contact me by phone at (207) 775-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman, Licensing Manager
Brookfield Renewable

cc: Relicensing Distribution List

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

**Federal Agencies**

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Stephanie Carman
Acting District Manager
Northeastern States
Bureau of Land Management
626 E. Wisconsin Avenue, Suite 200
Milwaukee, WI 53202-4617

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Kimberly Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Karen McGuire
New England Region 1
Deputy Regional Administrator
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

**State Agencies**

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Kyle Olcott
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Peter Jamieson
Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
40 Western Avenue
E.S. Muskie Federal Building, Room 412
Augusta, ME 04330

Stacey Guerin
State Senator
3 State House Station
Augusta, ME 04333

Kathy Irene Javner
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, Maine 04333

Trey Stewart
State Senator
3 State House Station
Augusta, ME 04333

James Lee White
State Represenative
House Minority Office
Room 332, State House
2 State House Station
Augusta, ME 04333-0002

**Native American Tribes**

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Rena Newell
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

**Additional Parties**

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground
ssindo@chewonki.org

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund
sperry@maine.com

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Jesika Lucarelli
Great Mountain Guide Service
greatmountaings@gmail.com

Mark Nadeau
International Association of Machinists
245 Pamola Park
Millinocket, ME 04462

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Director
Maine Professional River Outfitters
PO Box 669
Millinocket, ME 04462-0669

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing
mary@mxhmarketing.com

Matt Polstein
New England Outdoor Center
matt.polstein@gmail.com

Michael Smith
Outdoor Sport Institute
176 Highland Ave
Millinocket, ME 04462

Kenny DeCoster
Vice President
Penobscot Paddle and Chowder Society
towhee17@gmail.com

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Allison Economy
Representative for Allagash Gateway Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Thomas Nannery
Sportsman's Alliance of Maine
205 Church Hill Rd
Augusta, ME 04330-9801

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Brian Stranko
Maine Program Manager
Trout Unlimited
Brian.stranko@tu.org

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,
sharon.klein@maine.edu

Dean Beaupain
dean@bloomerrussell.com

Jeff Fayle
jfayle@gmail.com
Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti
granby@cox.net

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris
nsharris@mgh.harvard.edu

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Christopher Howe
funpow89@yahoo.com

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street,
NE Washington, DC 20426

November 17, 2023

Dear Secretary Bose,

Via Electronic Filing

Re: November 13, 2023. Ripogenus Hydroelectric Project (FERC No. 2572-133) Penobscot Mills Hydroelectric Project (FERC No. 2458-247) Updated No. ce of Operations Model Technical Workshop.

The Licensee's November 13, 2023 Filing notifies the agencies and stakeholders of the shift in the meeting site from Millinocket to Bangor and changes the workshop dates to January 10th and 11th 2024. However, the Licensee continues to insist on in-person attendance. This filing requests that the Licensee provides some method of remote attendance.

The scheduled workshop is intended to discuss the Licensee's Operation Model first filed on April 24, 2023. The model and its logic, data set(s) used, and output will be key to the balancing of uses when FERC staff and Maine Department of Environmental Protection develop a draft license including a 401 Water Quality Certification. My Filing of November 8, 2023, lists several issues contained in the Operation Model as presented.

Throught-out the ongoing licensing process the Licensee has provided remote conferencing capabilities. The January workshop is no different than past presentations; in fact, it is perhaps the most important. In my case, a winter trip to Bangor from Sarasota, Florida is an impossible burden to overcome. Without remote conferencing, distant stakeholders and possibly agency staffs are being purposely excluded.

I have been an active participant in the ongoing licensing process. Without remote access, I will be denied the opportunity to participate and possibly question the logic and input used in simulations presented in the Operations Model.

Thank you for the opportunity to request remote access to the January workshop.

Edward Spear

307 Mt Hope Ave
Bangor, Me 04401
Phone: 207-217-4288
Email: edspear1@yahoo.com

Brookfield
Renewable U.S.

December 19, 2023

***Via eFiling***

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Response to the Maine Council of Trout Unlimited's "Special Request"**

Dear Secretary Bose:

Great Lakes Hydro America, LLC (GLHA), the Licensee of the Ripogenus Hydroelectric Project (No. 2572) and the Penobscot Mills Hydroelectric Project (No. 2458) (collectively referred to as the "Projects"), herein files with the Federal Energy Regulatory Commission (FERC or Commission) responses to the November 9, 2023 "Special Request" filed by the Maine Council of Trout Unlimited (TU).

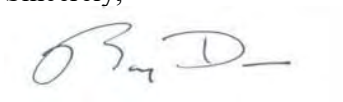
Formally commencing with GLHA's June 11, 2021 filing of the Notices of Intent and a Pre-Application Document (PAD) for the Projects, GLHA and the relicensing stakeholders have been engaged in routine consultation and studies through the Commission's stepwise Integrated Licensing Process (ILP). Whereas GLHA appreciates that stakeholders may file various comments on the Projects' dockets throughout the proceeding, in lieu of responding to each filing, GLHA is leveraging the defined ILP filings (e.g., study reports and license applications) to address applicable comments. GLHA believes that this approach is consistent with the Commission's ILP and provides an organized and systematic means of addressing comments applicable to the proceeding (e.g., the correspondence log to be included in the Draft License Application will document all of the correspondence).

However, based on recent filings (e.g., TU's November 9th "Special Request"), it appears that stakeholders may be misinterpreting information provided to date, as well as misunderstanding the relicensing process moving forward. In addition, a number of TU's "Special Request" comments appear to be repetitive to previous comments for which GLHA has responded. Whereas GLHA does not believe that it is necessary to provide the level of detail previously filed with the Commission and distributed/communicated to stakeholders in response to such comments, given that not all stakeholders may be reviewing the relicensing filings and responses to date, through this response, GLHA is identifying those comments that are incorrect and/or previously addressed.

Concurrent with this filing, GLHA is providing a copy of this response to all parties listed in the attached distribution list. In addition, parties can download an electronic copy of this filing from FERC's eLibrary system at https://www.ferc.gov/ferc-online/elibrary by conducting a search using the docket numbers P-2458 and/or P-2572.

If you have any questions regarding this filing, please contact me by phone at (207) 775-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman, Licensing Manager
Brookfield Renewable

cc: Relicensing Distribution List

Enclosed: Response to the Maine Council of Trout Unlimited's "Special Request"

January 5, 2024

Ms. Kimberly D. Bose
Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Via online submission to: http://www/ferc.gov**

Subject: **Response to Brookfield Comments Regarding Maine TU Council's Special Request and Concerns with Respect to the Determination on Requests for Study Modifications and New Studies for the Ripogenus and Penobscot Mills Hydroelectric Projects (P-2572 and P-2458)**

Dear Secretary Bose:

On behalf of its six chapters and over 2,000 members, Maine Council of Trout Unlimited (TU) submits this response to the Great Lakes Hydro America, LLC (Brookfield) letter dated December 19, 2023.

**Background**

Following the Initial Study Report Meeting and stakeholder comments,[1] Brookfield submitted its Responses to Comments on the Initial Study Report and Requests for New or Amended Studies.[2] FERC approved additional studies and study modifications but did not provide guidance on the Historical Ops Data Assessment Study and the Ops Model Study.[3] TU stated its specific concerns in its comments that also addressed the Ops Model Technical Workshop that Brookfield was scheduled for December 5 and 6;[4] Brookfield subsequently rescheduled the Workshop for January 10 and 11, 2024 in Bangor, but did not accommodate the request that "**teleconferencing be provided using state-of-the-art teleconferencing technology."**[5] This issue is time-critical.

**Time-critical Issue**

The Brookfield response to the request for a teleconference ("TU Comment #2") was: "…Based on past experience of GLHA's consultant, this will be a very technical two-day workshop and it is important that participants have a thorough understanding of the materials upon completion of the workshop. In order to achieve this goal, GLHA believes it is important that the workshop participants attend in person, as compared to a hybrid setting that would combine in-person and virtual participation and the associated distractions. Based on the responses to date, it appears that the in-person workshop will have a number of participants and GLHA looks forward to helping achieve the goal of the workshop."

[1] Staff Comments on the Initial Study Report and Initial Study Report Meeting Summary dated July 6, 2023.
[2] Brookfield Responses to Comments on the Initial Study Report and Requests for New or Amended Studies dated August 7, 2023.
[3] FERC Determination on Requests for Study Modifications and New Studies for the Ripogenus and Penobscot Mills Hydroelectric Projects dated September 19, 2023.
[4] Special Request Regarding Concerns of Maine Council of Trout Unlimited with Respect to the Determination on Requests for Study Modifications and New Studies for the Ripogenus and Penobscot Mills Hydroelectric Projects dated November 9, 2023.
[5] Brookfield letter of November 13, 2023, Subject: Ripogenus Hydroelectric Project (FERC No. 2572-133) Penobscot Mills Hydroelectric Project (FERC No. 2458-247) Updated Notice of Operations Model Technical Workshop.

While it appears that there will be a number of persons present at the Workshop, others will be unavailable to attend ***in person*** limiting stakeholder participation**.** The weather forecast for the western Maine mountains for January 9 and 10 predicts over a foot of snow that will prevent two of the participants in last May's ISR Meeting from safely traveling to participate in the workshop. Regardless of the Brookfield contractor's previous experience, teleconferencing providing both audio and video capability is the de facto standard for meetings involving multiple organizations and relatively large travel distances which is certainly the case here. Given the pervasive use of teleconferencing during and subsequent to the COVID 19 pandemic, Brookfield's explanation is simply not credible.

**Issues NOT Addressed by Brookfield Comments**

TU reiterated the obvious shortcomings of the Ops Model Study and Historic Operations Data Assessment Study in detail in its November 9, 2023 letter. These included problems in explaining hourly flows and data used to verify the Ops Model. These remain unanswered and apparently will remain so until the Updated Study Report.

**Other Issues**

The Brookfield response addressed other aspects of the TU letter that will be addressed in sequence. Shading is used to highlight TU responses to Brookfield comments and improve readability.

**TU Comment #1**

"The project Pre-application Document (PAD) stated that "GLHA maintains that a full suite of new studies is not needed, that the vast body of information on which today's certifications and licenses are soundly based and should be relied upon for these relicensings." The nongovernment organization (NGO) stakeholders took exception to this statement stating "Brookfield is required to provide FERC with information in the PAD and PSP referencing either relevant and recent existing studies or proposing new studies that address a number of subject areas including: Fish and Aquatic Resources, Recreation and Land Use, Aesthetic Resources and Tribal Resources. Instead, Brookfield relies on dated, unavailable, or non-existent studies or directs stakeholders to search for the information themselves at other agencies or on the Internet."

Brookfield Response

"GHLA does not understand the comment or appreciate the timing of the comment…"

**TU Response**

The point is that Brookfield did not enter into the relicensing by providing information required by the Pre-application Document, and has worked to avoid and/or delay addressing the information requirements needed to develop appropriate terms and conditions for the new license. Refusal to provide teleconferencing for the Workshop is another example of Brookfield making the process needlessly difficult for effective stakeholder participation.

**TU Comment #3**

The announcement states that "The purpose of the workshop is to further explain the model inputs, calibration, and verification." When TU asked at the ISR Meeting how the low water levels of Ripogenus

Lake occurred in two back-to-back years, the Brookfield response was that they were dry years and they were following the Ops Model.

Brookfield Response

"Based on the comment, there appears to be a misunderstanding of the purpose of the CHEOPS model (i.e., operations model) and how the model is used and will continue to be used. The Operations Model was not (and is not) used to influence Project operations or water levels, as that is not the intended use of the Operations Model. Instead, the Operations Model is a customized software tool used to evaluate and inform a wide range of physical and operational constraints on a hydroelectric facility or system. Using historical hydrology representative of the Project area, the model analyzes long-term water allocation associated with potential changes to the operation and physical configuration of the hydroelectric system. Whereas this information was presented during the May 2023 Initial Study Report (ISR) Meeting, it is possible that the hybrid nature of the meeting hindered the communication of this information to all of the meeting participants. This is an important aspect to the relicensing proceeding and, thus, this information will be presented again and in more detail during the January modeling workshop."

**TU Response**

We understand that Brookfield is using the Ops Model for planning purposes and to evaluate the impacts of various physical and operational constraints on the system. However, we maintain that Brookfield has caused confusion around the use of the model based on their statement during the ISR meeting that the drawdowns in 2021 and 2022 were the result of them "following the model." This statement suggests that model was being used for real-time operational decisions, which we don't believe is the case. To determine how much or little water can be released at various project nodes on any given day, which requires considering a variety of inputs, conditions, and the operator judgments and priorities. Brookfield has not been clear how those decisions are made. What model or other quantitative basis is there for making real time operational decisions?

Brookfield is raising chicken-egg questions with its explanation of how water is managed throughout the watershed. TU and other stakeholders are little better informed now than when the Initial Study Report was presented last May. It remains to be seen if the workshop will improve the situation.

Additionally, it is unreasonable to blame any confusion on the hybrid nature of the ISR Meeting. That a multi-million-dollar concern like Brookfield Renewable cannot do better than the crude setup it deployed at the last minute at that meeting is not believable. Maine TU Council routinely conducts its Board Meetings using a Meeting Owl. The technology provides both audio and video and has been completely reliable. This causes one to question whether Brookfield is acting in good faith.

**TU Comment #4**

"A key part of using the Ops Model is the monthly targets that are input. These are the ones that Brookfield uses. How target flows were determined was not explained and TU asked that information be provided in its ISR Comments. Since we do not see this being specifically addressed in the workshop agenda, TU asks that the basis for the monthly target lake levels be explained in detail at the workshop."

Brookfield Response

"As discussed during the May 2023 ISR Meeting, operations model inputs are defined and described in Section 5 of the Operations Model Logic and Validation Report provided as Appendix A of the ISR filed with FERC on April 24, 2023. Additionally, consistent with the purpose of the January workshop, GLHA intends to further explain the Operations Model inputs including the monthly impoundment elevation

targets that are used in the model. The model inputs are used to define the Baseline Scenario to represent the current operation of the Projects. As presented, the model inputs are based on license-required operations, or absent of license required operations (i.e., Ripogenus Impoundment), are based on typical operations."

**TU Response**

TU looks forward to Brookfield's explanation at the Workshop.

**TU Comment #5**

"TU asked for explanations of differences in operations over the winters of 2020 and 2021 compared with those of the subsequent winter that filled Ripogenus-Chesuncook Lake."

Brookfield Response

"Under normal inflows, the Ripogenus Project is operated such that the storage in the impoundment is utilized the meet the downstream flow and pond level requirements through mid-fall, at which time the whitewater boating flow requirements and pond level requirements at the North Twin Development end. Through the fall and early winter, the impoundment elevation is typically relatively stable. Starting early winter, the Ripogenus Project is operated to draw down the Ripogenus Impoundment to create storage for the spring freshet, which refills the impoundment in a normal year by late spring and then the annual cycle repeats.

During the winter of 2020, low inflows in the spring prevented the impoundment from fully refilling. Although GLHA utilizes indicators such as snowpack estimates, the drought conditions that were experienced in spring 2021, which contributed to the lack of refill in the spring of 2021, cannot be predicted. Due to the lack of refill in spring 2021 and the required downstream flow requirements, the Ripogenus Impoundment decreased to elevations of approximately 20 feet below normal full pond by the fall 2021, which is the elevation typical for the late spring drawdown. Due to these conditions, outflows from the Ripogenus Project were limited to minimum flows and eventually reduced below minimum flows (per agency approval) during the winter of 2021 to facilitate the refill of the Ripogenus impoundment in the spring 2022. As presented during the May ISR Meeting, as well as in the various additional relicensing meetings and filings, GLHA operates the system to balance the various license requirements and water interests associated with the larger Penobscot River watershed."

**TU Response**

The Brookfield response is oversimplistic. It is acknowledged that 2020 and 2021 were dry years – there were other dry years that did not result in the failure of the operator to fill Ripogenus-Chesuncook-Caribou Lake. What has never been explained with any specificity is how Brookfield determined that max generation during the winters preceding the summers of 2020 and 2021 made sense in terms of the Ops Model or Rule Curve or compared those parameters with the parameters used in determining the flows that finally filled Ripogenus-Chesuncook-Caribou Lake during the winter of 2021-2022. Unless the reasons for past problems are determined, they must be expected to recur.

**TU Comment #6**

"American Whitewater asked for specific Ops Model runs. This will be nearly six months ago by the time the workshop is held. TU asks that these model runs be presented and explained on the afternoon of day two of the workshop, or at least used as examples when explaining the workings of the ops model."

Brookfield Response

"Consistent with the ongoing study, during the Operations Model Workshop, GLHA and the stakeholders will review the schedule for submitting alternative operating scenario requests. GLHA will review the alternative operating scenario requests collectively, and subsequently run the requests using the model and then present the results. In the event that certain requests are the same or similar, GLHA may elect to run a select number of requested scenarios to avoid duplication. Each requested scenario is required to be accompanied by justification for the scenario (i.e., based on existing information, including study results) and an indication of the resource it is intended to support. American Whitewater has participated in similar modeling studies and understands this process."

**TU Response**

TU hopes that the American Whitewater requests are honored, and renews its request that they be covered at the Workshop

**TU Comment #7**

"Further review of the record by TU did not find a copy of the current water management plan that attaches to the current license. TU asks that a copy of the Water Management Plan be provided at the workshop and its relationship to the current Ops Model be explained."

Brookfield Response

As presented on multiple occasions, the "1991 Water Use Plan" is a misnomer in that as compared to a "management plan" that resulted from the previous licensing, the document was the licensee's proposed operation alternative prior to issuance of the existing license. As with every license issued by FERC under the Federal Power Act, license provisions supersede a licensee's proposals. Therefore, although the "plan" was the licensee's proposal for operating the Projects and portions of the "plan" were incorporated into the Projects' 1996 FERC Licenses, this "plan" (i.e., the licensee's proposal) is not the way the Projects are currently operated. The one exception is that the Water Use Plan is used as the basis for determining recreational flows from McKay Station at the Ripogenus Project. As indicated in Article 402 of the Ripogenus License, "The recreational flow for each month from May through September shall be determined on the first day of each month. This determination shall be based on an analysis of Total Available Water, as described in the Water Use Plan presented in the application for new license filed December 17, 1991, pages 10-14 of the Water Use Plan, Volume VII…"

A description of the history of the development of the "Water Use Plan" and its role in the existing license is provided in Section 5.5.1 of the Historic Operations Data Assessment Study Report provided as Appendix A of the ISR filed with FERC on April 24, 2023. This summary is repeated below. In support of the Projects' 1991 License Application, the Projects' previous licensee developed an operations model to determine whether and how the various agency and interest group-requested mitigation."

**TU Response**

The Licensee's current water management of the Ripogenus Project remains confusing. The Licensee appear to approach water management as a system wide issue rather than by individual facilities. Such a tactic ignores the environmental and recreation goals of the Ripogenus Project and creates confusion. Figures provided in an Appendix B of the April 2023 filing demonstrate that peaking flows grossly exceed the required minimum whitewater flow. The Stakeholders have identified major errors in the Operation Model of April 2023, and this adds to the confusion. Is the Ops Model the proposed management of the

Ripogenus Project? If this is the case, then changes from current to proposed operation need to be detailed and lake elevation and McKay Station flow targets provided.

The Licensee calls the 1991 Water Use Plan (WUP) a misnomer, as with many of the Licensee's statements during the process, it is simply their opinion. The Licensee continues to dismiss the WUP even though it was the foundation of the 1996 FERC License. The Licensee continues to argue that various License Articles altered lake level and flow goals presented in the WUP. The Licensee neglects to explain which, if any, Ripogenus License imposed conditions invalidate the WUP. The Licensee would have FERC believe that May-September whitewater and July-September Upper Gorge flows place and undue burden on Ripogenus-Chesuncook-Caribou Lake storage. Nothing could be further from the truth. Current peaking operation extend well beyond boating flow guarantees in both in time (13 hours) and flow (3500 cfs). The actual cost of Article 402 requirements is approximately 0.7 BCF or 6-7 inches of Ripogenus Impoundment head. In reality, it is the shift to peaking operations that defeats the WUP or any other empirically derived water management plan.

The 1996 FERC Ripogenus Project License provides the Licensee a great deal of operating flexibility. GNP could not do as they wished with storage, they needed hydro for co-generation. The Licensee has no such constrains. As a result, the Licensee moved from stable base flows into a peaking mode. It is disingenuous for the Licensee to repeatedly rebuff the WUP, and then blame in shift in operation on the minimal loss of storage resulting from 1996 License Article requirements.

TU's initial request remains valid. Please provide the current water management plan as it relates to the Ripogenus Project, noting refinements and modification from the 1996 FERC License application. Although the Licensee argues the WUP is obsolete they continue to direct readers to the WUP. The question at hand is "where is the current daily Licensee's water management plan" and how is it different the WUP? TU has attached Section 5.5.1 of the Historic Operations Data Assessment Study Report and the Water Management Plan as a convenience.

**TU Comment #8**

FERC commented on what was presented at the ISR Meeting: "The results of the Historic Operations Study were presented during the ISR meeting. The presentation included graphical representations of lake level and flows through the Ripogenus and Penobscot Mills Projects' developments. GLHA filed the operation data in electronic format on May22, 2023, along with the ISR Meeting Summary. To assist us and other stakeholders in comparing actual operational releases to the licensed releases, as well as better understanding the details of how the projects are operated, please revise the excel spreadsheets for each of the projects' developments to correlate the historical hourly flow data with the licensed flow requirements at the time.

Brookfield responded: "GLHA provided a detailed description and graphics of required Project operation in the Pre-Application Document (PAD) as well as the Initial Study Report (ISR)… GLHA believes that the Operations Model will be the appropriate tool to evaluate current and potential alternative operating scenarios in relation to water availability and allocation in support of issuing the new licenses."

TU Comment: FERC did not comment on this in its FERC Determination on Requests for Study Modifications and New Studies. TU supports the FERC request. Correlating historical hourly flow data with licensed flow requirements on an hourly basis to provide additional clarity to what it has already presented to this point.

Brookfield Response

"As discussed and presented on multiple occasions, GLHA has recorded and maintained the data required by Projects' existing licenses. Upon the initial requests for the historical operational data, which

the Projects' licenses do not require maintaining, GLHA communicated the challenges of developing this operational dataset. Although this was a significant effort, based on the best information, GLHA developed the requested dataset.

Regarding how this dataset compares to the compliance flow at a given point in time, GLHA has provided comprehensive descriptions of the license-required flows in the documents filed to date. However, it is nearly impossible to recreate historical hourly flow requirements for the period of interest, as many of the flow requirements, specifically those for the Ripogenus Project, were developed in consultation with agencies and/or are based on an evaluation of inflows on a weekly basis. Additionally, at times flows are modified in consultation with agencies to support required maintenance activities or in response to low inflows.

As indicated previously, although the historical operational dataset has been developed and distributed, GLHA does not believe critiquing or further evaluating the historical operations data will inform current operations or the New Licenses. Instead, GLHA continues to emphasize that the Operations Model will be the appropriate tool to evaluate alternative operating scenarios in relation to water availability and allocation for the benefit of resources of interest in support of issuing the New Licenses. In addition, as discussed during the May 2023 ISR Meeting, and to be further presented during the January 2024 model workshop, this data does not influence the accuracy or functionality of the model."

**TU Response**

Brookfield's response only make sense when taken completely out of context. NMFS PAD Comments requested a suite of functionally oriented studies: Indicators of Hydrologic Alteration Model, River Temperature in West Branch and Mainstem Penobscot River Study, and Future Flow and Water Temperature Scenarios/Climate Change Study that FERC rejected [SPD, pages B-38 to B-49] that had the potential to provide the information needed to determine terms and conditions of the new license of a functional basis. Brookfield proposed the Ops Model Study and Historic Operations Data Assessment Study in their stead that FERC accepted. That the information needed to explain the methodology used to manage flows and water levels for the Ripogenus and Chesuncook Mills Projects was not required to be maintained is immaterial in this context. The result is that we are headed toward a conclusion of the study phase of the relicensing without the functional information needed to determine enforceable terms and conditions for the new license, a situation perfect for the licensee, intolerable to the stakeholders.

**TU Comment #9**

"The figures showing hourly McKay Station flows based on generation data show flows of 4000 cfs, especially Figure 12 below. These exceed the 3500 cfs hydraulic capacity of McKay Station [Preapplication Document dated June 11, 2021, page 4-14.] When queried at the ISR Meeting, the Brookfield response was the flows were not completely accurate and a range of variability was not available. This continues to cast doubt on the results of the analysis." Further analysis indicates that the figure is even more misleading than TU originally thought because the upper limits of the hourly flow values appear to be truncated at 4000 cfs and are actually worse than the graph provided depicts. Brookfield goes on to validate the ops model using circular logic that is not valid. TU submits that while Brookfield was the organization that proposed both the Historical Ops Model Study and the Ops Model Studies as replacements for studies requested by NOAA fisheries, Brookfield has not justified this replacement. Additional rationale for this conclusion is provided in subsequent paragraphs.

Brookfield Response: Includes the statements "… the Projects' existing licenses do not require the maintenance of flow data (e.g., for the past 20 years), and hence, the development of the requested

historical data set has been both a labor-intensive activity, as well as dependent upon available data, which appears to include some anomalies or outliers. “Also, “In addition, GLHA notes that the observations associated with the comments (i.e., flows greater than 3,500 cfs) appear to be limited to the data between 2004 and 2013.”

TU Reply: The first statement is immaterial. Since Brookfield proposed the studies, Brookfield should have the data to defend them. If the observations associated with comments that are obviously incorrect didn’t persist, then why were they used?”

Brookfield Response

“Based on these comments, it appears that TU is confusing the Historical Operations Data Assessment with the Operations Model Study. These are two separate studies and serve very different purposes. The Historical Operations Data Assessment was performed in response to stakeholder requests for historical data. The Operations Model Study is directly related to the development and future use of the model. GLHA believes that it is important that stakeholders appreciate the difference between these studies and how the study results will be used in the proceeding. Whereas this information was presented during the May 2023 ISR Meeting, it is possible that the hybrid nature of the meeting hindered the communication of this information to all of the meeting participants. Given the importance of this difference to the relicensing proceeding, the difference between these two studies will be further discussed during the January modeling workshop.

As communicated previously, and in response to Comment #8, the Historical Operations Data Assessment provides the best historical operational data available. The dataset represents the raw data to be reviewed by the relicensing stakeholders. This study is unrelated to the model being developed or other studies requested by others.

As indicated in the Historic Operations Data Assessment Study Report, outflows from McKay Station are calculated from generation (kilowatts) and the differential in headpond and tailrace elevations. The headpond and tailrace elevations are measured by transducers. In 2020, the tailrace transducer was identified to be in poor condition and was replaced. GLHA periodically inspects and maintain/replaces the headpond transducer(s). Additionally, in early 2020, GLHA implemented updates to the program that calculates station outflows, which removed sources of variability in the previous program and improved the overall consistency and accuracy of the calculated station outflows. As indicated previously, GLHA does not believe that the proceeding will benefit from further evaluation of historical data that does not influence current operations or the future license requirements.”

**TU Response**

The Historical Ops Model Study and Ops Model Study should be complementary, and is it reasonable for TU to ask that the studies be consistent. Brookfield was able to convince FERC to adopt its studies over those proposed by NMFS. As it currently stands, the model has not been validated and Brookfield’s statement above confirms TU’s contention that Brookfield lacks the data to do so.

**TU Comment #10**

FERC Comment: “During the ISR meeting, and as documented in the ISR Meeting Summary, Maine TU raised concerns regarding the results of the validation run of the Operations Model. Maine TU indicates that, for the calendar year 2020, the modeled results do not line up well with the actual reported impoundment levels and releases for the Ripogenus Project. To address concerns about the model and to improve the outcome of the second year of the study, which involves developing alternative

operating scenarios to model, GLHA raised and the group discussed the concept of GLHA establishing a working group for the operations modeling. Establishing a working group could be beneficial to this process. If such a group is established, a technical work session could be convened to familiarize the members of the working group with the CHEOPS model, including how it works, as well as the models' assumptions and limitations. Such an approach could help to improve understanding of the model and ensure that all reasonable alternatives identified by stakeholders are modeled during the second year of studies."

Brookfield Response: "The Operations Model Study Report will be updated to include additional descriptions of the application of daily target elevations at the Ripogenus, North Twin, and Millinocket Lake Storage developments in the verification scenario as well as how the model utilizes target, spill and minimum elevation inputs during scenario execution. Additionally, expanded discussion will be added to the Operations Model Study Report to describe the simulated versus actual allocation of water between the Ripogenus and North Twin developments for the calendar year 2020 and 2021. GLHA is planning to convene an Operations Model Technical Conference with interested stakeholders to explain how the model was developed (including model inputs), how the model was calibrated and verified, how the model will be used in the relicensing process, and the framework for requesting alternative operating scenarios. GLHA anticipates conducting the technical conference in fall 2023. Subsequently, GLHA will evaluate reasonable alternative operating scenarios requested by stakeholders with results provided to stakeholders in early 2024 and filed with FERC in the USR by April 22, 2024."

TU Response: Operations models can be challenging to validate to historical data, especially when 1) trying to model a whole system of reservoirs as they are, and 2) the data needed to do this correctly likely does not exist. The most critical issue with their verification is the use of the "daily varying target elevations" for Ripogenus Lake and others. It appears that those "daily varying target elevations" are in fact historical elevations, and historical elevations were used as an input to the model, and then compared the output to those same elevations for verification. To avoid this circle, actual target elevations must be used as the input. Those targets changed year to year (based on snowpack, forecast rain, etc.), but it appears that Brookfield did not document that. This would mean that there is no record of those historical targets and thus they cannot be used to verify the model. Brookfield specifically states that "(note for Ripogenus, North Twin, and Millinocket Lake Storage developments, the target elevation shown on the figures is the historical elevations).15 (sic)

TU Request: That Brookfield at least provide some example runs at the workshop from those requested by American Whitewater or TU demonstrating how daily varying target levels were determined. The joint of American Whitewater and the Appalachian Mountain Club is included as Attachment D for convenience. Examples will have to be used to illustrate, why not use those requested months ago by stakeholders? Brookfield Comments:" The Operations Model Study Report will be updated to include additional descriptions of the application of daily target elevations at the Ripogenus, North Twin, and Millinocket Lake Storage developments in the verification scenario as well as how the model utilizes target, spill and minimum elevation inputs."

TU Response: TU asks that discrepancies noted in its ISR comments be addressed specifically at the workshop.

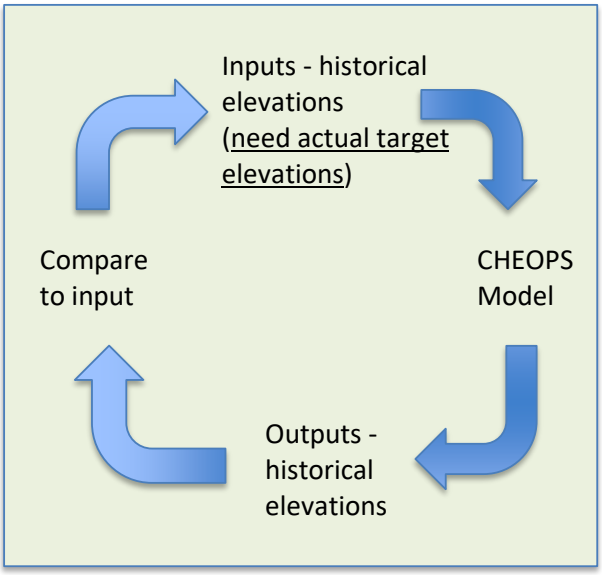
Brookfield Response

"As indicated previously, during the Operations Model Workshop on January 10-11, 2024, GLHA will further explain the Operations Model inputs including the impoundment elevation targets that are used in the Baseline scenario as well as those used in the Verification scenario. GLHA believes that it will be important for the workshop participants to understand these concepts upon completion of the workshop. The Operations Model Baseline scenario inputs are based on license-required operations, or

absent of license-required operations (i.e., Ripogenus Impoundment), are based on typical operations as this scenario represents current operations of the Projects. For example, the target elevations for Ripogenus Impoundment in the Baseline Scenario are based on typical operations informed by an evaluation of historical operations data. The Baseline Scenario is the control in which all alternative operating scenarios evaluated by the model are compared against. GLHA looks forward to the workshop and further conversations related to the model. (Underlining supplied for clarity)

**TU Response**

Brookfield is declining to address key failures of water management that have occurred under its ownership. Brookfield is unable to validate the model using studies that it proposed because it does not have the data required to validate it and could only appear to validate the model by using circular logic: the same proposition occurs as both a premise and a conclusion—the argument validates itself. If these issues are left unaddressed by the new license, the reasonable expectation is for the same problems including the dewatering of Ripogenus-Chesuncook-Caribou Lake to continue to occur, and given the instability brought on by climate change, for the dewaterings to increase in frequency and magnitude.




**Summary**

Brookfield fails to substantively address a number of the concerns voiced in Maine TU Council's Special Request Regarding Concerns of Maine Council of Trout Unlimited with Respect to the Determination on Requests for Study Modifications and New Studies for the Ripogenus and Penobscot Mills Hydroelectric Projects.

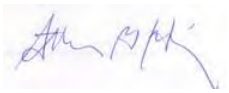
TU reiterates its prior requests, especially the most time critical:

- **That the Workshop employ state-of-the-art teleconferencing technology to include stakeholders who will otherwise not be able to participate**
- That the specific shortcomings of their studies detailed in Maine TU Council ISR Comments dated July 5, 2023 and reiterated in its Special Request Regarding Concerns of Maine Council of Trout Unlimited with Respect to the Determination on Requests for Study Modifications and New Studies for the Ripogenus and Penobscot Mills Hydroelectric Projects be specifically addressed at the workshop to the extent possible. To do otherwise endorses continuing delay establishing the information baseline needed for the new license.

It is apparent that major changes to project operations will be required for both projects to address obvious problems that lax terms and conditions of the current license permitted in a failed attempt to keep Great Northern Paper's mills open. Examples are the dewatering of five miles of the main stem of the West Branch of the Penobscot River below Stone Dam and the fish kills that have been regularly occurring below Ripogenus Dam incident to generator trip events, something that FERC Compliance is already working to improve on in the short term.

Maine TU Council appreciates the Commission's attention to these comments on these important projects and hopes that the Commission will act to acquire the information needed to enable the Commission to balance project harms and benefits. This will prove to be impossible unless enforceable terms and conditions regarding Ripogenus-Chesuncook-Caribou Lake levels and flows at Ripogenus Dam are determined.

Respectfully,



Stephen G. Heinz
Maine TU Council FERC Coordinator

**Additional Distribution**:
Email copy to FERC Office of Public Participation

**Attachments**:
A - Section 5.5.1 of the Historic Operations Data Assessment Study Report
B - Ripogenus – Penobscot Mills Water Management Plan

for the USGS gage at Grindstone, Maine, compared to 2021 being the driest year at the Ripogenus Project.

**Table 12. 2001 – 2022 Water year classification based on calculated inflow to Ripogenus Project**

| Sorted Hydrology Ranking | | | |
|---|---|---|---|
| Year | Average Annual Inflow (cfs) | Rank | Description |
| 2021 | 1,579 | 22 | Dryest |
| 2001 | 1,735 | 21 | Dry |
| 2002 | 1,824 | 20 | Dry |
| 2016 | 2,072 | 19 | Dry |
| 2004 | 2,139 | 18 | Dry |
| 2020 | 2,316 | 17 | Dry |
| 2015 | 2,320 | 16 | Dry-Average |
| 2012 | 2,377 | 15 | Dry-Average |
| 2013 | 2,502 | 14 | Dry-Average |
| 2003 | 2,588 | 13 | Dry-Average |
| 2018 | 2,616 | 12 | Average |
| 2010 | 2,669 | 11 | Average |
| 2014 | 2,690 | 10 | Average |
| 2022 | 2,741 | 9 | Wet-Average |
| 2007 | 2,956 | 8 | Wet-Average |
| 2009 | 2,981 | 7 | Wet-Average |
| 2017 | 2,994 | 6 | Wet-Average |
| 2006 | 3,113 | 5 | Wet |
| 2019 | 3,173 | 4 | Wet |
| 2008 | 3,409 | 3 | Wet |
| 2011 | 3,505 | 2 | Wet |
| 2005 | 3,554 | 1 | Wettest |

## 5.5 Description of Project Operations

### 5.5.1 Project Operations prior to 1996 Licenses

FERC issued original licenses for the Projects in 1968, under which the Projects were operated until issuance of the current licenses on October 22, 1996. The 1968 license for the Penobscot Mills Project did not contain articles related to the operation of the Project. The 1968 license for the Ripogenus Project included two articles related to the operation of the Project.

- Article 32 required that the Project operate in such a manner so as to provide an outflow during the flood season which, when combined with the runoff of the intervening area

between the Ripogenus Project and the North Twin Development, will not cause an outflow that would exceed the spillway capacity of the North Twin Development.

- Article 33 required that the Project operate to provide a minimum flow of 200 cfs[2], as long as any storage remains in Ripogenus Lake, in the West Branch immediately below McKay Station and, following consultation with the Maine Department of Inland Fisheries and Wildlife (MDIFW) and the U.S. Fish and Wildlife Service (USFWS), take such steps as may be necessary to protect the fishery resources in the river channel between the dam and McKay Station.

Although operations data is not available for the period under the 1968 license, a description of how the Projects were typically operated is provided in the 1991 License Application filed with FERC in support of obtaining new licenses for the Projects in 1996, which is summarized below.

Under the 1968 licenses, McKay Station generated 40 Hz power into the local power grid (to power the Millinocket and East Millinocket paper mills), with loads supplied by the grid being mostly large groundwood grinder motors where loads varied significantly during the grinding process. Due to the large size of these loads relative to the 40 Hz system, the system was prone to frequency upsets when the load changes occurred. Individual hydro governor controls on each hydro unit sensed the change in frequency when the load on a grinder motor changed and adjusted generator outputs in terms of flow and generation to compensate for the change and achieve a new balance. These frequency changes and governor responses made it impossible to maintain instantaneous flows at all 40 Hz hydro generators, particularly at McKay Station, which was the first station to respond to a frequency upset. (GNNC 1991).

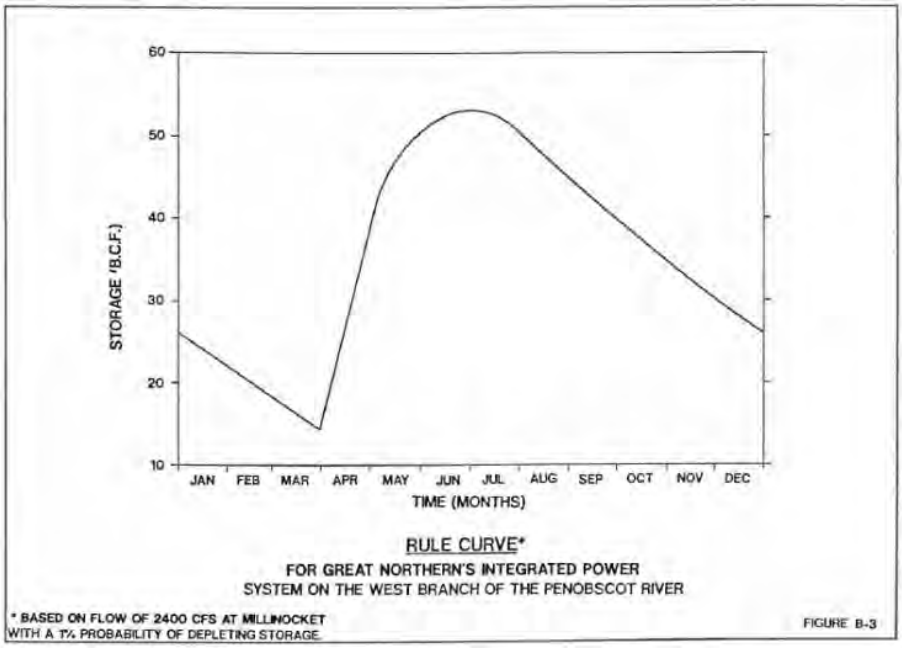
Under the 1968 licenses, the previous licensee operated the integrated power system (Ripogenus impoundment and other storage impoundments, located upstream and downstream) on an annual storage cycle. These storage impoundments have a total usable storage capacity of 58.7 billion cubic feet (BCF), of which the Ripogenus impoundment provides 30 BCF (51% of the total) and were drawn down during the year to provide controlled downstream flows. The spring runoff was used to replenish storage in the impoundments. Water was withdrawn at a controlled rate from the

[2] The 1991 License Application indicates that the Project was typically operated to voluntarily maintain a minimum flow of 500 cfs (verses the required 200 cfs) below McKay Station to protect salmon redds during the incubation period.

storage impoundments during the year to provide maximum sustained base-load energy in accordance with the system-wide rule curve, to provide storage capacity for the following spring, and to address additional system constraints (GNNC 1991).

Given that the Projects operate as a system, there was no Project-specific rule curve for the Ripogenus Project; rather the Project was operated using a system-wide rule curve (as shown in Figure 4 below, which was extracted from the 1991 License Application). The system-wide rule curve was a statistical curve based on providing an average daily flow of 2,400 cfs at Millinocket, with a 1 percent probability of running out of storage. The amount of available storage within the storage system was monitored continuously and operation of the entire system was adjusted, as necessary, to maintain overall storage conditions within close proximity to the level indicated on the system-wide rule curve (GNNC 1991).

**Figure 4. West Branch Penobscot River System-Wide Rule Curve (from 1991 License Application)**




The annual cyclic system of operating these storage projects provided flood control during high flow periods by storing the majority of the runoff, while providing a more even distribution of water flow throughout the West Branch over the course of the year. Even when the impoundments were filled to capacity and water was spilled, the maximum discharge was greatly reduced in

magnitude and delayed in time until peak flows from the downstream, unregulated rivers subsided (GNNC 1991).

The 1991 License Application indicated that from 1970 to 1985, the Ripogenus impoundment had been drawn down approximately 16.5 feet on average with the greatest drawdown being 30.6 feet below normal full pond elevation to provide controlled flows downstream and provide sufficient storage capability to capture spring runoff. Since McKay Station became operational in 1953, the maximum the impoundment was drawn down was nearly 42 feet, briefly, during an extremely dry (drought) year. Prior to 1970, the flow in the West Branch was also used for log driving (GNNC 1991).

*Water Use Plan*

In support of the Projects' 1991 License Application, the Projects' previous licensee developed an operations model to determine whether and how the various agency and interest group-requested mitigation measures, enhancements, or changes in Project operations (which sometimes conflicted with each other) could be implemented at the Projects. A report describing the development of the operations model and the resulting Water Use Plan (i.e., the Licensee's proposed operations alternative) was provided in Volume VII of the 1991 License Applications for the Ripogenus and Penobscot Mills Projects. The purpose of the model and associated evaluations was the following:

- Identify and rank the existing and potential uses of water at the Projects;
- Determine the available water for use to meet the agency and interest group requests, which were specified during the consultation process;
- Analyze existing flow data to identify available water during a wet year and a dry year;
- Determine the inflow to the impoundments on an annual basis; and
- Define a range of normal available water that the Projects would operate within.

The Water Use Plan provided in the 1991 License Application proposed to implement adjustments to the previous system management to provide enhancements to the environmental resources while maintaining efficient operation of the hydroelectric system. Although the adjustments had a negative impact on generation, the adjustments did not require a change to the system rule curve, which was based on total system storage. Instead, the Water Use Plan, with its total available water

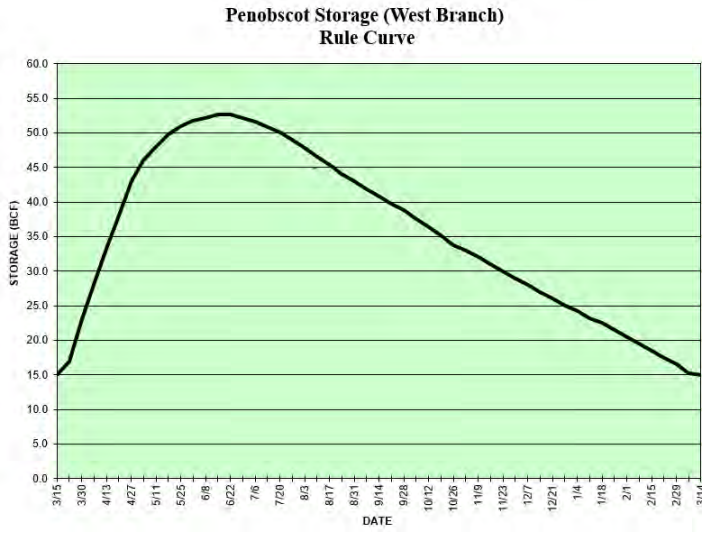
curve, was to be used to supplement the rule curve to meet various water use requirements in that area.

The 1991 Water Use Plan (i.e., the licensee's proposed operation alternative) was developed prior to issuance of the Projects' existing licenses and was the ***basis*** for the operational requirements included in the Projects' 1996 FERC Licenses. However, as compared to the Water Use Plan, the Projects' current operations are defined by the requirements of the Projects' licenses. Therefore, the 1991 Water Use Plan is not a "management plan" consistent with other management plans resulting from a relicensing proceeding. The one exception being that the Water Use Plan is used as the basis for determining recreational flows from McKay Station at the Ripogenus Project. As indicated in Article 402 of the Ripogenus License, "*The recreational flow for each month from May through September shall be determined on the first day of each month. This determination shall be based on an analysis of Total Available Water, as described in the Water Use Plan presented in the application for new license filed December 17, 1991, pages 10-14 of the Water Use Plan, Volume VII…*"

### 5.5.2 Project Operations under 1996 Licenses, as Amended

The Ripogenus and Penobscot Mills Projects are operated as a combined system using the same system-wide rule curve as described above that has been used since the 1970s as shown in Figure 5 below.

**Figure _5. West Branch Penobscot River System-Wide Rule Curve (current)**



Attachment B

# WATER USE PLAN
# for
# RIPOGENUS & PENOBSCOT MILLS PROJECTS

**(FERC Nos. 2572 and 2458)**

**GREAT NORTHERN NEKOOSA CORPORATION**

WATER USE PLAN
for
RIPOGENUS & PENOBSCOT MILLS
PROJECTS
(FERC Nos. 2572 and 2458)

GREAT NORTHERN NEKOOSA CORPORATION

## ABSTRACT

In response to agency and interest group comments received during second-stage consultation, Great Northern Nekoosa ("Great Northern") developed a model of its entire hydro system. This model produced the Water Use Plan, a significant re-regulation of Great Northern's entire reservoir and hydro-generation system to meet, wherever possible, the resource use and management goals identified by agencies and private groups in second-stage consultation.

Although not required to do so, Great Northern has been operating its system, on a trial basis, according to the Water Use Plan since Spring 1991. While the results of this trial demonstrate that the Water Use Plan is feasible as described in this report, they also indicate that further modification cannot be accommodated without imposing unacceptable impacts on the Water Use Plan or on the economic viability of Great Northern.

By considering the total storage volume above Ripogenus Dam, the model showed that Great Northern could meet the goals of: stable summer recreation flows and spawning and incubation flows for salmon on the West Branch below McKay Station; relatively stable summer water levels in the North Twin impoundment; a fall drawdown of North Twin for lake trout incubation and winter water levels to protect lake trout spawning; and a continuous minimum flow of 2,000 cfs below Millinocket. In order to provide these benefits, the Ripogenus impoundment would continue to be drawn down. Also, Great Northern is proposing to provide leakage flows in the Back Channel, and is proposing to maintain the minimum flow in Millinocket Stream at 20 cfs. Where Great Northern had originally proposed a year-round minimum flow of 50 cfs in the Upper Gorge, it now proposes 100 cfs for the months of July, August, and September to accommodate plans for an adult salmon fishery, and proposes only leakage flows for the remainder of the year. For recreational boating, Great Northern proposes to set as a goal a summer (May 1 to September 15) flow of at least 2,000 cfs below McKay Station for normal months, and at least 1,800 cfs during wet or dry months.

GREAT NORTHERN NEKOOSA CORPORATION

SUMMARY OF THE WATER USE PLAN FOR THE RIPOGENUS AND PENOBSCOT MILLS PROJECTS

Great Northern Nekoosa Corporation ("Great Northern") is in the process of relicensing its Ripogenus and Penobscot Mills Projects. During initial and second-stage consultation, various state and federal agencies and interest groups identified mitigation measures, enhancements, or changes in project operations that they believed should be implemented by Great Northern or by the Federal Energy Regulatory Commission ("FERC") as conditions of new licenses for the projects. Working with its consultant, Stone & Webster Engineering Corporation ("Stone & Webster"), Great Northern developed a model of its hydro system to determine whether and how these sometimes conflicting agency water use requests could be implemented.

This report describes the development of that model and presents the Water Use Plan that has been developed by Great Northern. It supplements an oral presentation to environmental agencies and interest groups in Bangor, Maine on February 25 and 26, 1991 and discussions with them at various times since then. A preliminary plan was provided to the agencies and interest groups on April 26, 1991. Additionally, follow up meetings were held on June 28, 1991 and October 7, 1991 with the Maine Department of Environmental Protection ("MEDEP"). All comments received since then have been incorporated into this report. As described below, the Water Use Plan has been analyzed in detail to determine whether

it meets Great Northern's power requirements and to determine whether additional environmental enhancements or mitigation measures requested by the agencies could be accommodated. As revised, the Water Use Plan meets Great Northern's requirements and some additional agency requests, but cannot be modified to predictably accommodate further agency requests without imposing unacceptable impacts on the Water Use Plan or on the economic viability of Great Northern.

**Introduction:**

The starting point of the study was the present method of operating the Great Northern hydro system. As described in the second-stage consultation draft of Great Northern's license applications, the hydro system is managed on the basis of a historically-derived rule curve to maximize sustained power generation to Great Northern's pulp and paper mills in Millinocket and East Millinocket. Lake levels are not controlled for nonpower purposes, and the only minimum flows that are provided are 200 cfs below McKay Station, 20 cfs below Millinocket Lake Dam, and 2000 cfs at Millinocket. Until this study was conducted, Great Northern did not propose to make any other changes in project operations during relicensing.

Given this existing situation, the purpose of the study was to identify and rank the existing and potential uses of water at the Projects, to determine the available water for use to meet the agency and interest group requests which were specified during the

consultation process, to analyze existing flow data to identify available water during a wet year and a dry year, to determine the inflow to the impoundments on an annual basis, and to define a range of normal available water that the Projects would operate within. The next step was to determine a Water Use Plan that addresses the agency and interest group requests, and the last step was to examine the power impact of that Water Use Plan to determine whether the net available power generation would be adequate to support Great Northern's operations.

Summary of Results:

At the outset, the first working tool was a comprehensive matrix that would identify all the requests that have been made for use of the water. This is represented in Table 1. The table identifies the water bodies, the agency request, the reason for the request, and the time period (during the year) for the request. The right hand column gives an indication of what the model outcome results are relative to the various requests during a normal water year.

To summarize the information in Table 1, what follows are brief descriptions of the conclusions of the water use study. The detailed discussion that follows the description of the water use model will further explain the basis for the conclusions of the study.

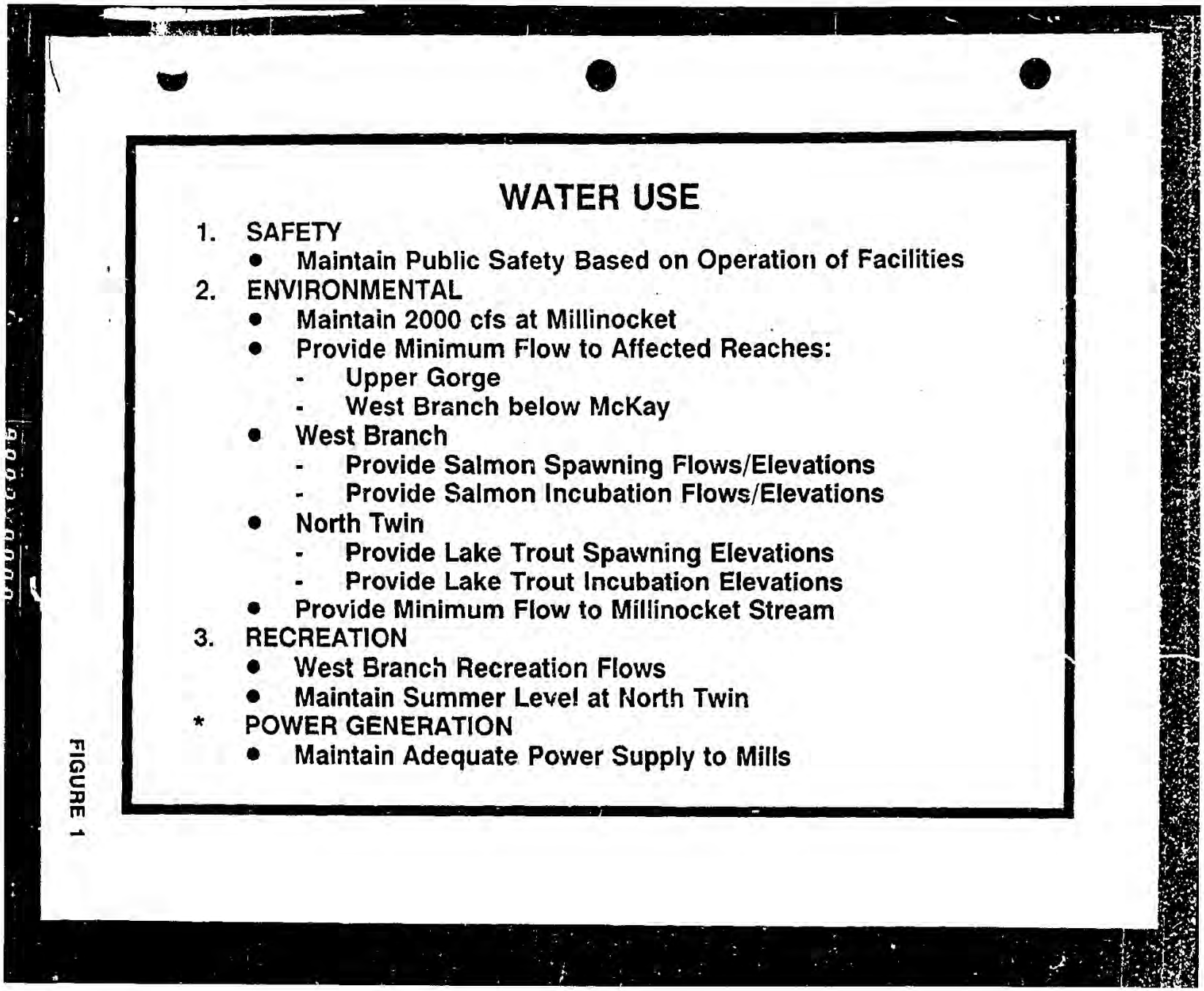

WATER USE
1. SAFETY
• Maintain Public Safety Based on Operation of Facilities
2. ENVIRONMENTAL
• Maintain 2000 cfs at Millinocket
• Provide Minimum Flow to Affected Reaches:
- Upper Gorge
- West Branch below McKay
• West Branch
- Provide Salmon Spawning Flows/Elevations
- Provide Salmon Incubation Flows/Elevations
• North Twin
- Provide Lake Trout Spawning Elevations
- Provide Lake Trout Incubation Elevations
• Provide Minimum Flow to Millinocket Stream
3. RECREATION
• West Branch Recreation Flows
• Maintain Summer Level at North Twin
* POWER GENERATION
• Maintain Adequate Power Supply to Mills

FIGURE 1

At the Ripogenus impoundment, an agency request was for relatively-stable water levels. The reason for more stable water levels was the enhancement of wildlife, wetlands, recreation, and aesthetics. There was also a conflicting agency request to maintain current operations providing downstream fishery and recreational benefits. The relevant time periods were: wildlife from May 1 to July 15; wetlands, recreation, and aesthetics from May 1 to September 30. The last column indicates a minus in that area, which means that the Water Use Plan cannot satisfy this request without jeopardizing other uses and benefits.

For the West Branch below McKay Station, agencies, MEPRO, and private boaters had recommended 2400 to 3600 cfs for recreational flows from May 1 to October 15. Table 1 indicates a plus in that area, meaning that this request can be satisfied, in the manner and to the extent discussed in detail below.

For the salmon fishery the request was to release the ABF minimum flow or to perform an IFIM study; the time period covered runs from June 15 to September 30. Table 1 indicates a plus in this area. Again, the results are discussed in detail below.

For salmon spawning and salmon incubation the agencies have requested Great Northern to maintain certain interrelated flows and elevations. The time periods identified are October 15 to November 15 for spawning and November 16 to June 7 for incubation. Table 1 indicates a plus in that area.

In the Upper Gorge, Great Northern had proposed 50 cfs during the entire year. The agencies had requested minimum flows of 100 cfs from July 1 to September 30 and 50 cfs during the remainder of the year to enhance the salmon fishery. Table 1 indicates a plus in that area as further explained below.

Looking at the North Twin and Millinocket Lake impoundments, the agencies and Save Our Scenic Lakes had requested relatively stable water levels, for the same reasons as at Ripogenus. The time period is May 1 to July 15 for wildlife, and May 1 to September 30 for wetlands, recreation and aesthetics. Significantly, Table 1 indicates a plus in these areas for North Twin.

The agencies requested a drawdown limit at North Twin to protect lake trout spawning and lake trout incubation. They identified periods of October 15 to November 5 for spawning, and November 6 to May 1 for incubation. Significantly, Table 1 indicates a plus in that area as well.

In the Back Channel, there was a request for 350 to 500 cfs to provide year-round salmon habitat. In Millinocket Stream, 60 to 80 cfs were requested to provide year-round salmon habitat. The model indicates a minus in both areas. Provision of these minimum flows would undermine the viability of the Water Use Plan in meeting other requests for water uses; but this result is further explained below.



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And, lastly, on the West Branch a minimum flow of 2000 cfs was requested on the basis of year-round, water quality and migratory fishery considerations. As discussed in more detail below, Table 1 indicates a plus in that area.

What this summary highlights is that all of the requests for water distributions or flow to achieve mitigation or enhancements are interrelated. Providing water for one purpose may facilitate one enhancement or mitigation measure and conflict with still others. The flow model enabled Great Northern to identify the linkages and to develop a Water Use Plan that satisfied the most important agency requests, while still meeting Great Northern's electrical requirements. The internal reviews demonstrate clearly that meeting some agency requests cannot be accomplished without imposing unacceptable economic costs on Great Northern or requiring major changes in or abandonment of, the enhancement or mitigation measures that can otherwise be provided.

Prioritizing Water Uses:

After identifying each requested water use, it was necessary to prioritize them to rank conflicting agency requests and operating requirements. This is illustrated by Figure 1.

RIPOGENUS AND PENOBSCOT MILLS PROJECTS
WATER USE

| Waterbody | Agency Request | Reason | Time Period | Model Outcome |
|---|---|---|---|---|
| Ripogenus Impoundment | "relatively stable" water levels | wildlife<br>wetlands, recreation, aesthetics | 1 May - 15 July<br>1 May - 30 Sept. | [redacted] |
| West Branch Flow | 2,400 - 3,600 cfs | rafting | 1 May - 15 Oct. | |
| | ABF or Study | salmon fishery | 15 June - 30 Sept. | |
| | maintain flow/ elevation | salmon spawning<br>salmon incubation | 15 Oct. - 15 Nov.<br>16 Nov. - 7 June | |
| Upper Gorge Flow | 100 cfs<br>50 cfs | salmon fishery<br>salmon fishery | 1 July - 30 Sept.<br>1 Oct. - 30 June | |
| North Twin & Millinocket Lake Impoundments | "relatively stable" water levels | wildlife<br>wetlands, recreation, aesthetics | 1 May - 15 July<br>1 May - 30 Sept. | |
| | drawdown limit | lake trout spawning<br>lake trout incubation | 15 Oct. - 5 Nov.<br>6 Nov. - 1 May | |
| Back Channel | 350 - 500 cfs | fishery habitat | year-round | |
| Millinocket Stream | 60 - 80 cfs | fishery habitat | year-round | |
| West Branch | 2,000 cfs instantaneously | water quality | year-round | |

TABLE 1

The first -- and overriding -- priority is safety: whatever Water Use Plan is developed must continue the existing levels of flood control and maintain public safety based on proper operation of the facilities and compliance with FERC safety requirements. Any plan that does not ensure safe operation and flood control would be unacceptable to both Great Northern and FERC.

The second ranking was providing environmental benefits. This would lead to continuing to maintain the 2000 cfs at Millinocket; providing minimum flows to the affected reaches in the Upper Gorge, in the West Branch below McKay, and in Millinocket Stream, if possible; and providing salmon spawning flows and salmon incubation flows in the West Branch. Similarly, meeting the environmental priority at North Twin would lead to providing water elevations for lake trout spawning, as well as, for lake trout incubation following the spawning season.

The third priority was meeting agency requests relating to recreation. Thus, consistent with the first two priorities, the plan would provide West Branch recreation flows, and would maintain the relatively stable summer levels at North Twin.

The final -- and for Great Northern and the State of Maine's economy and job market, overriding -- consideration is power generation. In other words, having set forth these three ranked agency and interest group goals of what a Water Use Plan is going to try to provide to meet agency requests, it is necessary to come



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back to power generation and make sure that the licensee, Great Northern, can still maintain adequate power supplies to the mills. Stone & Webster and Great Northern have completed an analysis with the power generation model which confirms that this Water Use Plan is achievable.

Based on this information, Great Northern believes that during normal water years it will be able to maintain these commitments as it files its applications for new licenses. As explained below, the Water Use Plan must be modified slightly during dry and wet years.

**Period of Record:**

The Water Use Plan described below has a study review period of 1976 to 1990, which provides 15 years of detailed hydrologic data. That period of record reflects the most current record of Great Northern's present mode of operation of the entire system. Ten years of historical data is an absolute minimum requirement for hydrologic analysis. Looking at the mass inflow curves for the 15 years analyzed here, Stone & Webster has identified both very wet years and very dry years. Moreover, the available water study discussed below also determines the wettest and driest weeks of the 15-year period. This use of the 15-year period of record and the wettest and driest individual weekly analysis confirms the validity of the 15-year period of record used in the analysis.



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Total Available Water:

Previous discussions of Project operations have centered on the system rule curve at Millinocket. The rule curve represents the total system storage at a given point in time. With information on total storage that is available, certain flows have historically been maintained at Ripogenus and Millinocket. This curve will still be used to determine flow releases.

Many of the water use requirements considered in this Water Use Plan are in the Upper West Branch of the Penobscot River in the vicinity of Ripogenus Dam and McKay Station. To meet various water use requirements in this area, it was necessary to supplement the hydro system rule curve, which is based on total hydro system storage, including storage at the North Twin and Millinocket Lake impoundments. The water in these impoundments is not available to satisfy requirements in the Upper West Branch. Therefore, it was necessary to come up with a means of defining available water in the Ripogenus and upstream impoundments that could be used to satisfy the various requests.

The concept of "total available water" at Ripogenus Dam meets this requirement. Total available water is defined as the storage volume that is available at the end of the week, plus the discharge volume released during the week. Adding these two quantities, which have been recorded separately in the past by Great Northern, gives the total amount of water available to meet the various requirements during a given week. The total available water at



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Ripogenus Dam had not been recorded in the past and one of the objectives of this study was to develop this information.

Figure 2 represents the total available water at Ripogenus. It includes the water that is being held in the upstream storage impoundments and Ripogenus Dam, showing a year's data from January to December. The data presented in the curve is based on average weekly data; each point is average weekly available water in this case.

The "wet year" data represents the individual wettest weekly data for each week during the study period of 15 years. The "dry year" data represents the results of a similar type analysis of the driest weekly data for each week during the study period. The range of "normal" available water highlighted in blue represents the expected available water during normal hydrologic conditions. It is defined as the range between x-s and x+s, where "x" is the mean value and "s" the standard deviation. Based on a statistical analysis, total available water would be expected to be within this "normal" range two-thirds of the time, and outside this range one-third of the time. Because the wet and dry years are constructed with data from all 15 years in the period of record, they represent more extreme conditions than any historical wet or dry year.



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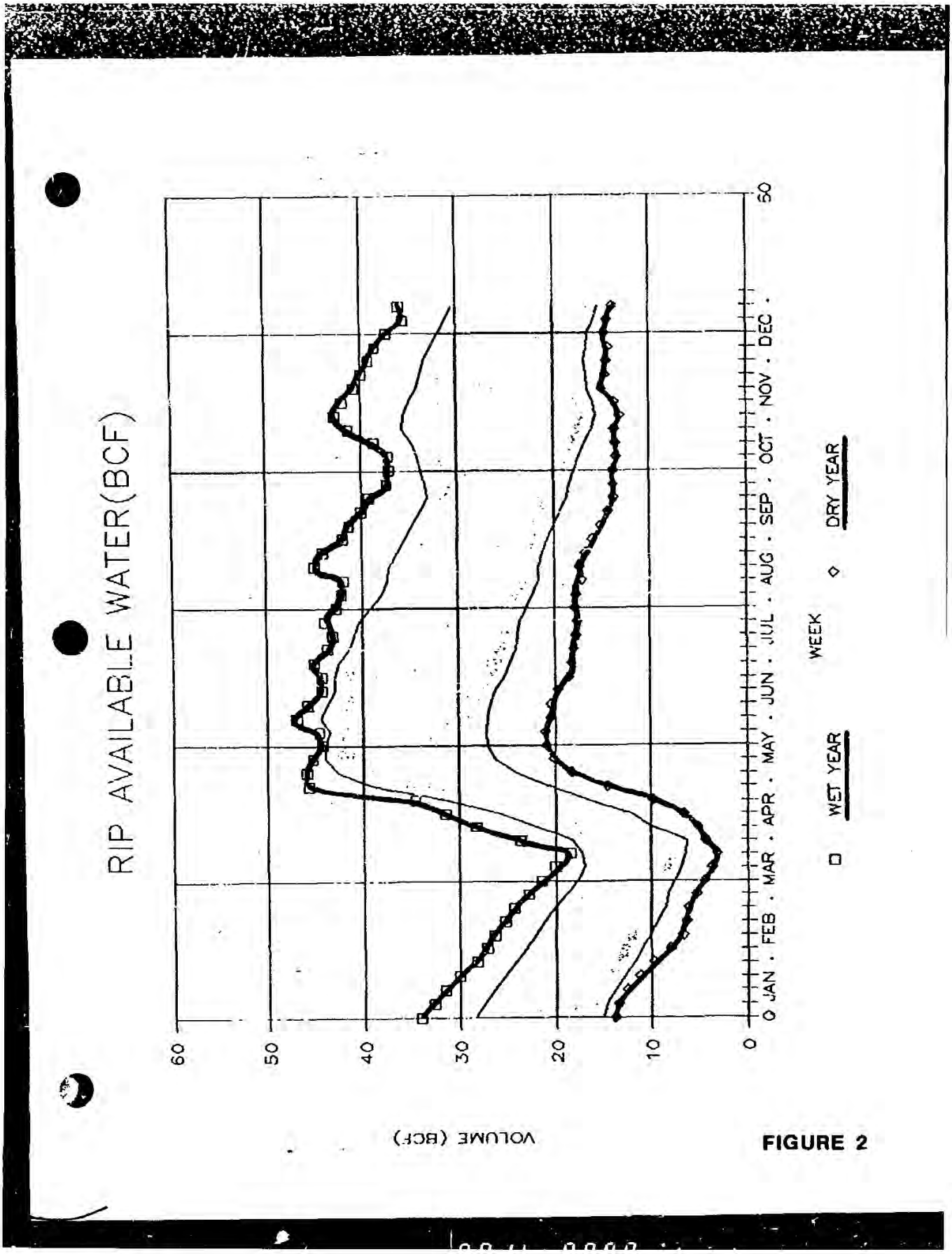

RIP AVAILABLE WATER(BCF)
VOLUME (BCF)
60
50
40
30
20
10
0
0 JAN . FEB . MAR . APR . MAY . JUN . JUL . AUG . SEP . OCT . NOV . DEC . 50
WEEK
□ WET YEAR
◇ DRY YEAR

**FIGURE 2**

To illustrate the use of this concept with recreational flow requirements, if the total available water at the beginning of a month were within this band of normal available water, and if that month fell between the beginning of May and mid-September, then recreational flows of 2000 cfs or higher would be released during that month. If total available water were above this band or below this band, the Water Use Plan would prescribe a recreation flow of at least 1800 cfs. The details of these particular recreational flows are discussed further in this report in the section entitled, "Details of Water Use Plan."

Mass Inflow Data:

Figure 3 is a mass inflow curve which examines, from another perspective than storage and discharge, what water is available for use. Figure 3 looks at the calculated inflow to the Ripogenus impoundment from January through December for each year during the period of record. The historical inflow to the Ripogenus impoundment is determined on a weekly basis. Inflow data are added on a weekly basis to get a cumulative inflow total through the year and this data is plotted out through the end of the year. As expected, the curves show there is a great variability in the inflow of the impoundments from year to year. This explains why Figure 2 shows a band of normal available water. Due to the variability of the mass inflow, it is necessary to project some band of normal available water to operate in.



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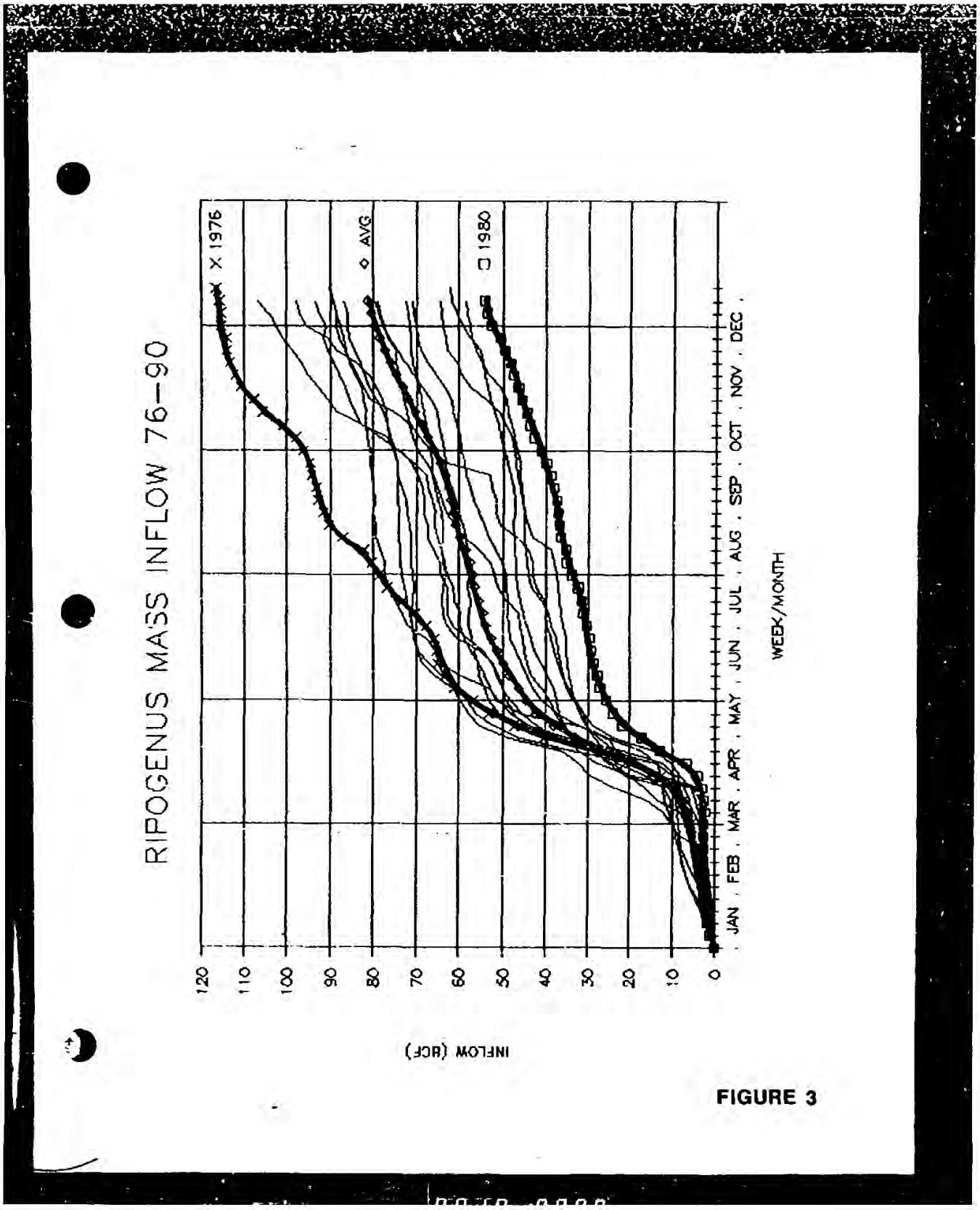

RIPOGENUS MASS INFLOW 76–90
X 1976
◇ AVG
□ 1980
INFLOW (RCF)
120
110
100
90
80
70
60
50
40
30
20
10
0
JAN . FEB . MAR . APR . MAY . JUN . JUL . AUG . SEP . OCT . NOV . DEC .
WEEK/MONTH

**FIGURE 3**

Figure 3 shows that the reservoirs have reached their peak elevation for the year during early June. At that point the initial storage for that year, in terms of the spring runoff, is known. The plots show that there is a great variation in terms of the total available inflow from year to year. Thus, in May, there is a range of 35 billion cubic feet (bcf). This variation increases to 45 bcf in July, 55 bcf in October, and 65 bcf in December.

The lines plotted on Figure 3 are the individual yearly curves, and in some cases as one moves through the summer, there can be a wet period towards the end of the year and the curve goes up steeply. There are also periods when there is a drop-off in the runoff and the corresponding inflow due to the summer being dry; as a result, the total annual inflow would come out relatively lower. This illustrates why it is impossible to make a predictive determination, before the end of the year, whether the upcoming period will be wet, dry, or normal.

Proposed Water Use Plan:

The Water Use Plan based on these inputs is outlined on Figure 4. The Plan provides salmon spawning flows in the West Branch below McKay from October 15 to November 15, and maintains an incubation flow from November 16 to June 7. The Plan also provides a lake trout spawning elevation in the North Twin impoundment from October 15 to November 5 and then maintains at least that elevation during the incubation season from November 6 through May 1.

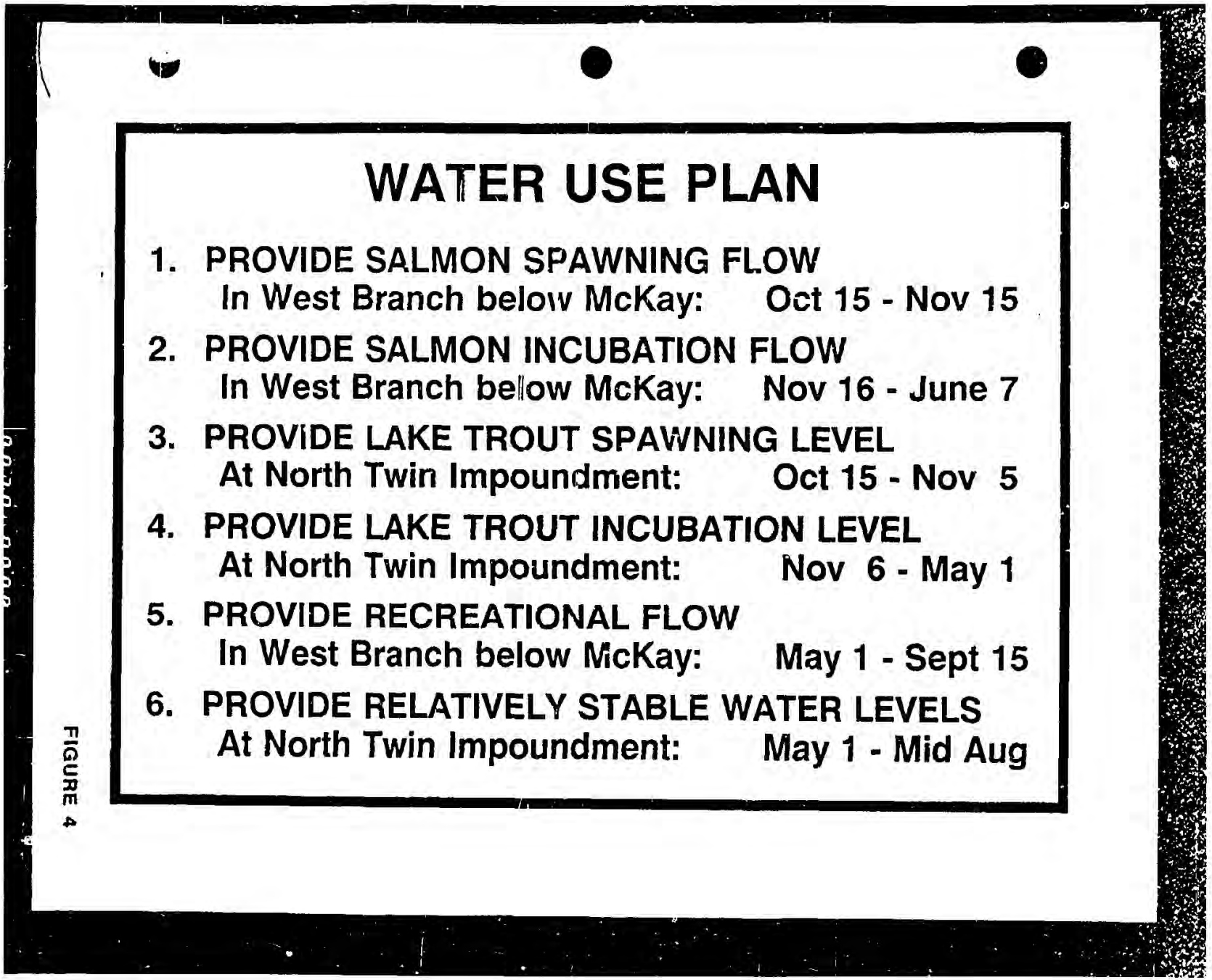

WATER USE PLAN
1. PROVIDE SALMON SPAWNING FLOW
In West Branch below McKay: Oct 15 - Nov 15
2. PROVIDE SALMON INCUBATION FLOW
In West Branch below McKay: Nov 16 - June 7
3. PROVIDE LAKE TROUT SPAWNING LEVEL
At North Twin Impoundment: Oct 15 - Nov 5
4. PROVIDE LAKE TROUT INCUBATION LEVEL
At North Twin Impoundment: Nov 6 - May 1
5. PROVIDE RECREATIONAL FLOW
In West Branch below McKay: May 1 - Sept 15
6. PROVIDE RELATIVELY STABLE WATER LEVELS
At North Twin Impoundment: May 1 - Mid Aug

FIGURE 4

No changes are proposed for Millinocket Lake, which will be used as needed to provide a supply of water for North Twin to maintain the Water Use Plan benefits. The Plan would provide spring and summer recreational boating flows on the West Branch below McKay, and would provide relatively stable summer water levels at the North Twin impoundment.

Included in the Water Use Plan but not shown on Figure 4 are provisions for minimum instantaneous flows of 100 cfs in the Upper Gorge to provide fishing opportunity from July 1 to September 30, 400 cfs below McKay Station, and 20 cfs in Millinocket Stream. As indicated by Table 1, this last flow was proposed by Great Northern; the earlier agency request (made prior to the Water Use Plan) for higher flows cannot be satisfied. These flows have no significant impact on the overall water use analysis, because in general, the flows modeled in the Water Use Plan are well above these numbers.

The change from the second-stage consultation draft that is most immediately apparent is that the plan intends to maintain a lake trout fishery in the North Twin impoundment. In order to accomplish this goal, the minimum flow in Millinocket Stream must be maintained at its historical level of 20 cfs, as currently prescribed in the Penobscot Mills license, to make better use of that water in the North Twin impoundment to maintain the lake trout fishery.

Figure 5 shows the historical and the revised outflow from the Ripogenus impoundment based on the typical conditions in the period studied. The historical Ripogenus outflow for the period of study is shown in blue. Historically, in the spring there are relatively high flows, dropping off into the late summer, coming back up with a relatively high flow period due to the fall rains and the leaves coming off the trees which results in increased runoff.

The proposed revised Ripogenus outflow is shown in red. For this typical data set, a recreational flow of 2400 cfs is shown from the beginning of May to the middle of September. The 2400 cfs is illustrative only and was derived from the water that is typically available during this period. The flow of 2400 cfs is greater than the minimum flow of 2000 cfs identified for rafting flows in a normal month.

Following the recreational season, there is a period from September 16 through October 14 when there is a need to control the outflow from McKay Station so that the downstream North Twin impoundment can be drawn down to provide enhancements at that impoundment. For the typical conditions shown on Figure 5, the outflow from Ripogenus was reduced to 2000 cfs during this period, but this flow is illustrative only and will depend on storage and rainfall conditions, as well as, system maintenance requirements each year.

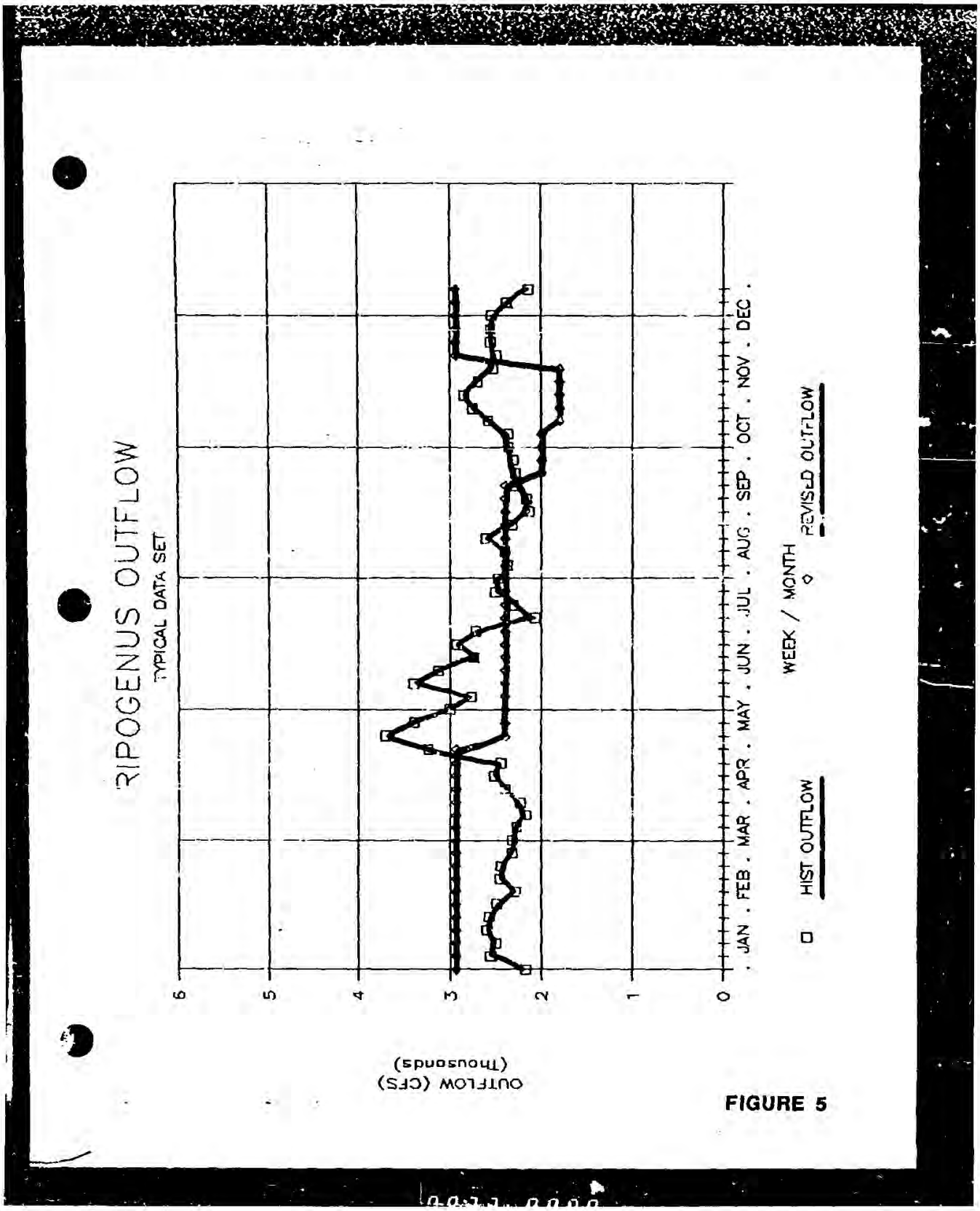

RIPOGENUS OUTFLOW
TYPICAL DATA SET
OUTFLOW (CFS)
(Thousands)
6
5
4
3
2
1
0
. JAN . FEB . MAR . APR . MAY . JUN . JUL . AUG . SEP . OCT . NOV . DEC .
WEEK / MONTH
□ HIST OUTFLOW
◇ REVISED OUTFLOW

**FIGURE 5**

From October 15 through November 15 Great Northern proposes reduced flows out of Ripogenus, typically 1300 to 2000 cfs, which would provide the salmon spawning flow below McKay Station. This flow will confine spawning to the deeper, more protected channel areas that can be protected against freezing during the ensuing winter. Prior to the start of each salmon spawning season, Great Northern will establish the flow range that will be provided during that spawning season. During the salmon incubation period (typically November 16 to June 7), Great Northern proposes to maintain incubation flows in the West Branch downstream of McKay Station. These flows will be established based on actual flows occurring during the preceding salmon spawning period and will typically equal or exceed the salmon spawning flows.

Although the plot is based on typical weekly data, these flows would be maintained as closely as possible on a 7-day-a-week, 24 hours a day basis during that period, provided storage is available upstream of Ripogenus Dam. However, as discussed below, these are not intended as instantaneous flows and cannot be provided on that basis.

McKay Station generates 40 cycle power into a power grid which is essentially an island. Loads supplied by this grid are mostly large ground wood grinder motors (8000 hp each at East Millinocket Mill) whose load varies significantly during the grinding process. Due to the large size of these loads relative to the entire 40 Hz system, the system is necessarily prone to frequency upsets when these load changes occur. Individual hydro governor controls on

each hydro unit sense the change in frequency when the load on a grinder motor changes and adjust generator outputs in terms of flow and generation to compensate for the change and achieve a new balance. These frequency changes and governor responses make it impossible to maintain instantaneous flows at all 40 Hz hydro generators, particularly at McKay Station, which is the first station to respond to a frequency upset. McKay Station's governor controls are designed to be more sensitive in order to provide the required compensation and to keep the 40 Hz electrical system in balance. These changes are of short duration, typically lasting 5 to 15 minutes. For these reasons it will be possible to regulate flows below McKay Station pursuant to the Water Use Plan only to an hourly average.

As developed on the following figures, the flow after spawning season is critical in terms of providing sufficient inflow to maintain both the North Twin elevation for the lake trout fishery and the required minimum flows at Millinocket.

Figure 6 shows the historical and the revised discharge from the North Twin development downstream from Ripogenus. Again, the historical data shows relatively high quantities of available water during the spring period as the impoundment fills. Flows come down during the summer and come up again in the fall.

The proposed revised mode of operation would provide, on average, relatively higher flows during the winter and early spring. There would be relatively lower discharges during the summer in order to maintain the impoundment at a relatively stable level. Of course, the 2000 cfs minimum flow at Millinocket is maintained at all times.

At the end of the summer period, there would be an increase in discharge from North Twin, which is required to draw the impoundment elevation down for lake trout spawning. After the increase in discharge during the drawdown period at the end of the summer, the outflow will be maintained relatively lower than historically during the spawning season at North Twin, and, depending on inflow, will increase somewhat throughout the rest of the year.

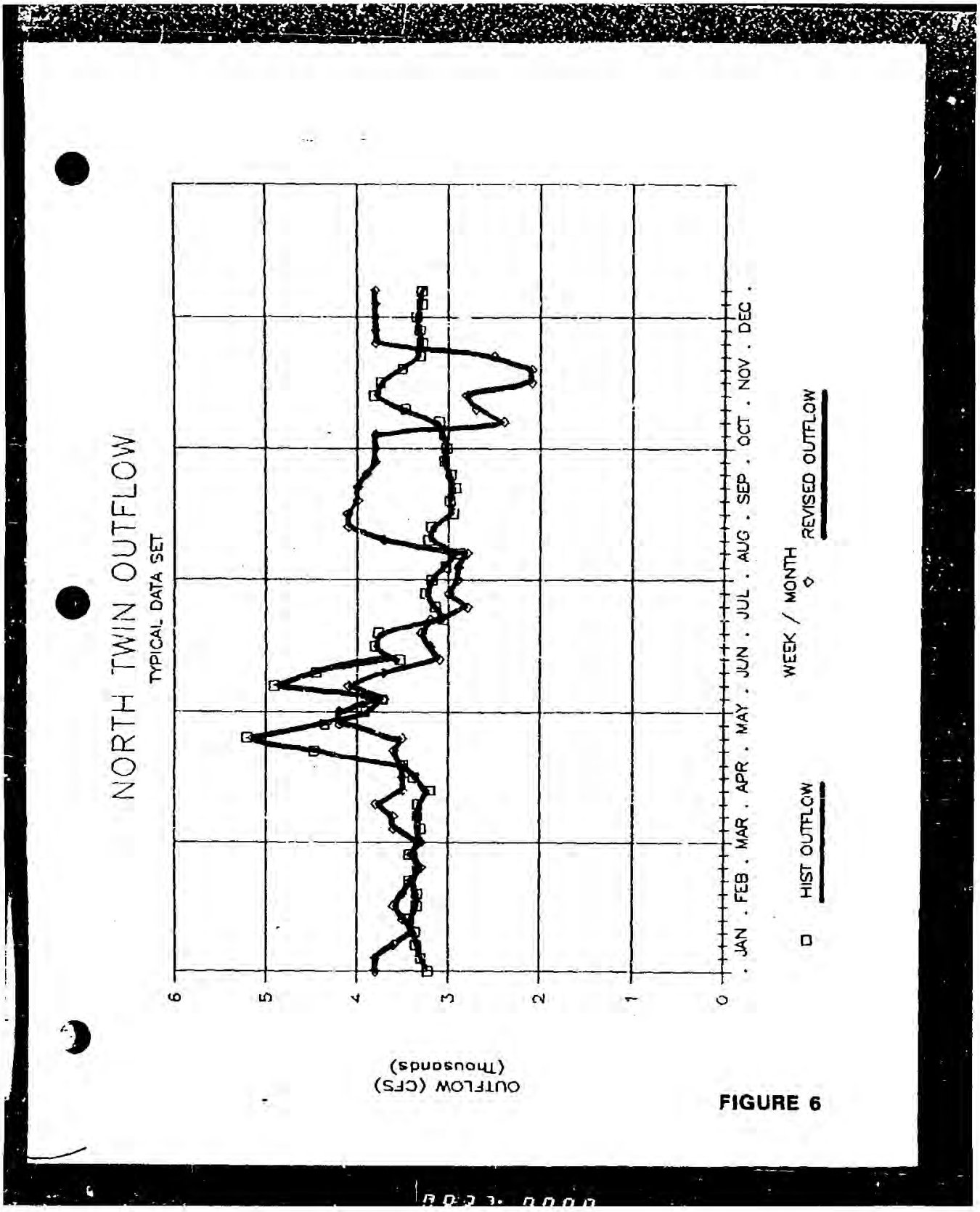

NORTH TWIN OUTFLOW
TYPICAL DATA SET
OUTFLOW (CFS)
(Thousands)
6
5
4
3
2
1
0
. JAN . FEB . MAR . APR . MAY . JUN . JUL . AUG . SEP . OCT . NOV . DEC .
WEEK / MONTH
HIST OUTFLOW
REVISED OUTFLOW

**FIGURE 6**

Figure 7 is a plot of impoundment elevations at North Twin based on the typical data set. It shows that with the historical operation, North Twin would have been drawn down coming into the spring, filled during the spring runoff into early summer, and drawn down again during the late summer coming into the fall.

The Water Use Plan shows a drawdown to a reasonably low elevation to allow lake trout spawning. Flows would then be adjusted in order to maintain at least this elevation through the incubation period which extends to May 1 of the following year. Then, as the spring runoff takes place, the impoundment would be brought up to a relatively stable elevation that will be maintained during the summer. Full pond elevation at North Twin is approximately 492 ft. (USGS). The summer elevation shown in Figure 7 is approximately 490.5 ft. This does not mean that Great Northern does not attempt to fill North Twin; it does. The 490.5 ft. elevation is based on using the typical data set. The pond would be filled up to full pond during wet years, and to well below the 490.5 ft. elevation during dry years. Great Northern would normally maintain some available volume at North Twin to allow for storage of normal seasonal precipitation events. The operating plan concept would remain the same in all years.

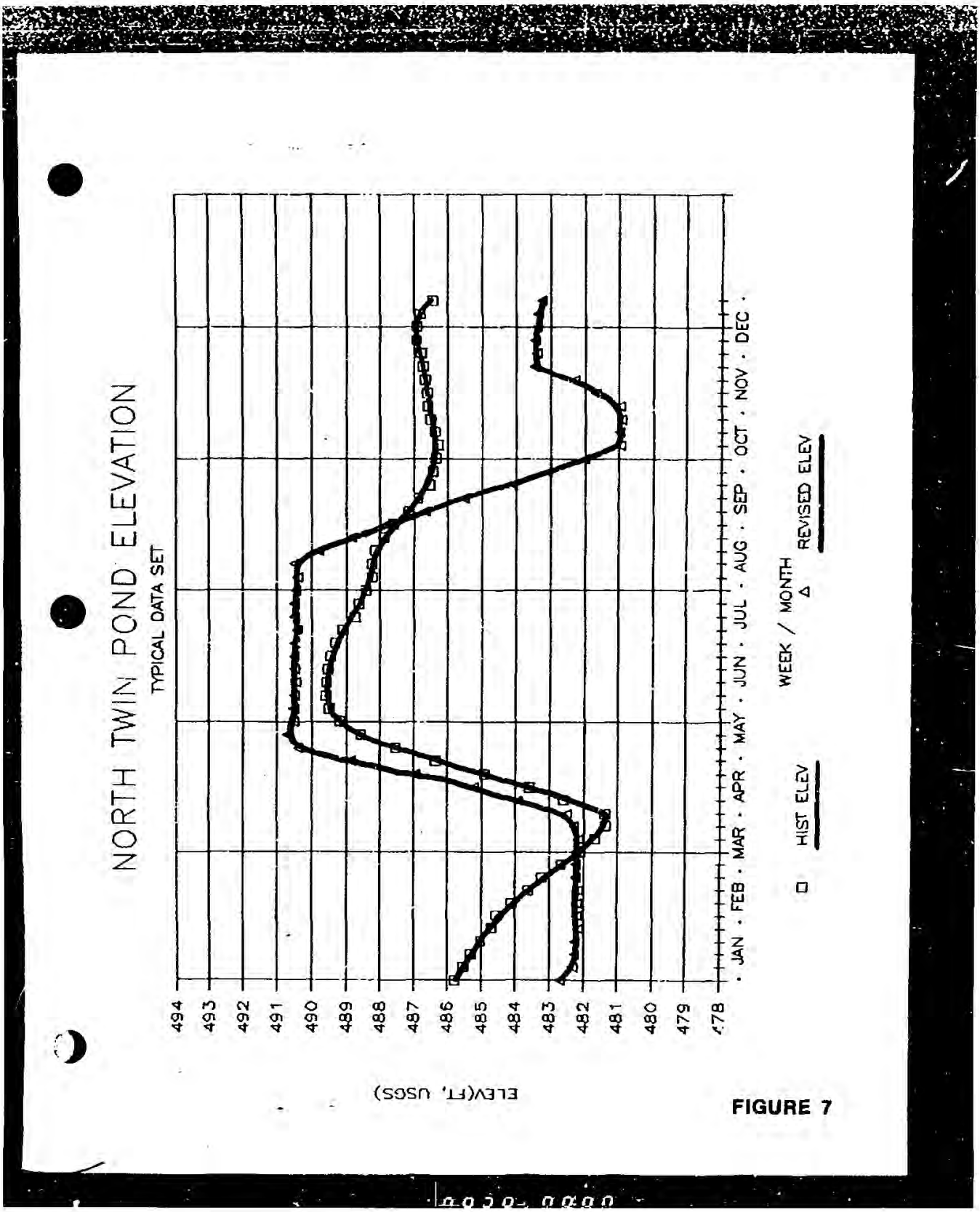

NORTH TWIN POND ELEVATION
TYPICAL DATA SET
ELEV(FT, USGS)
494
493
492
491
490
489
488
487
486
485
484
483
482
481
480
479
478
JAN · FEB · MAR · APR · MAY · JUN · JUL · AUG · SEP · OCT · NOV · DEC
WEEK / MONTH
HIST ELEV
REVISED ELEV

**FIGURE 7**

Figure 8 shows the interaction between the Ripogenus discharge and the operation of North Twin to maintain the lake trout fishery. The figure shows that there is an overlap at the end of the recreational period, from mid-September to mid-October, when continued high recreation flows below McKay Station would conflict with the need to complete the drawdown of the North Twin impoundment for the spawning season. As a result, because the discharge from Ripogenus is the majority of the inflow into the North Twin impoundment, it will be necessary in some years to limit the discharge of water from Ripogenus by mid-September, at the latest, in order to draw North Twin down to maintain the lake trout fishery.

Figure 8 also shows that there is a critical time during the salmon spawning season in the West Branch. During the spawning season below Ripogenus, flows are brought down to approximately 1800 cfs in this typical case. At the same time, a minimum discharge of 2000 cfs must be maintained at North Twin at all times to provide for minimum flow requirements downstream, and North Twin's reservoir elevation must be maintained constant. In summary, as the elevation is maintained for the fishery at North Twin, the required outflow at North Twin is always interacting with this discharge from Ripogenus during that same part of the year.

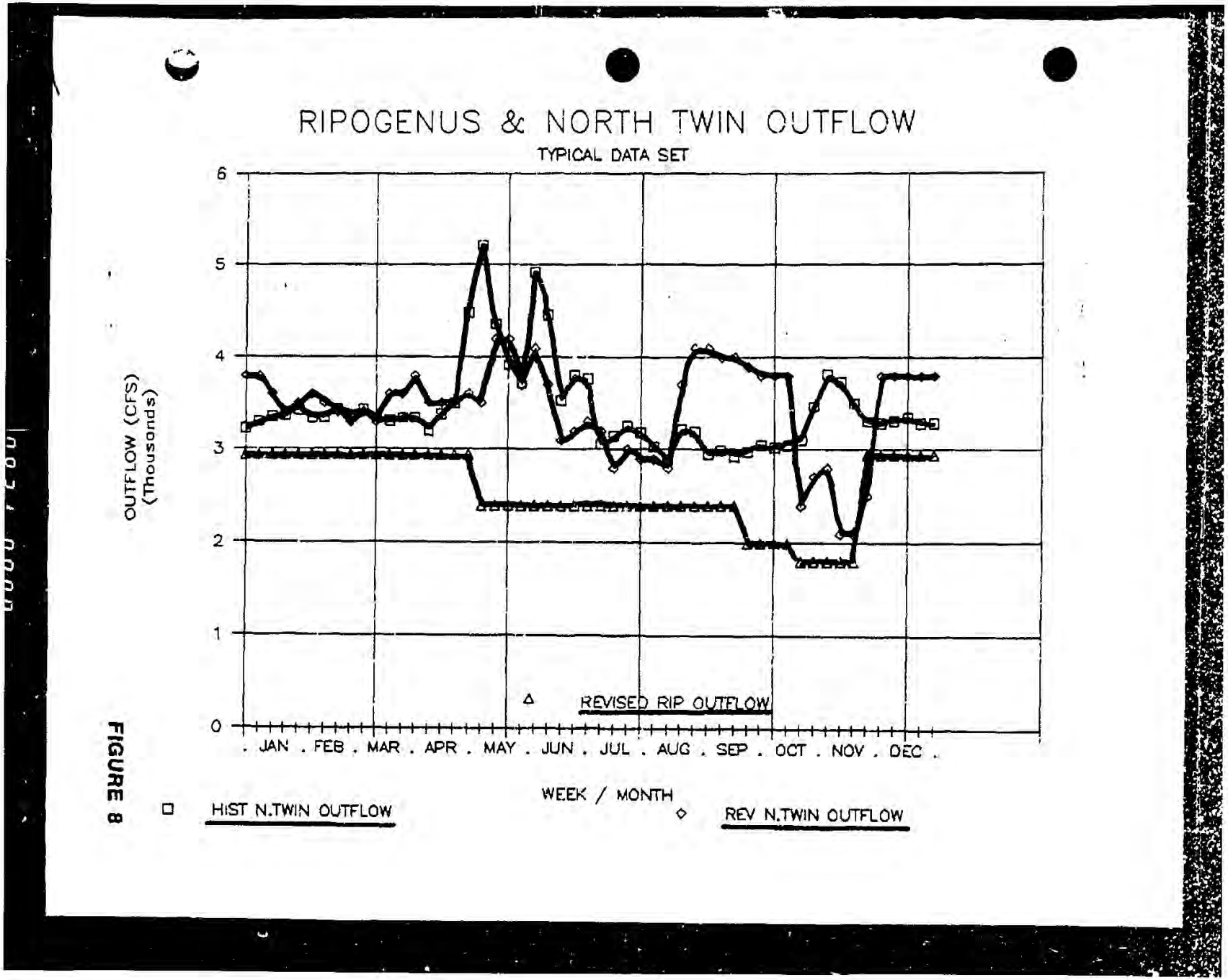

RIPOGENUS & NORTH TWIN OUTFLOW
TYPICAL DATA SET
OUTFLOW (CFS)
(Thousands)
6
5
4
3
2
1
0
. JAN . FEB . MAR . APR . MAY . JUN . JUL . AUG . SEP . OCT . NOV . DEC .
WEEK / MONTH
REVISED RIP OUTFLOW
HIST N.TWIN OUTFLOW
REV N.TWIN OUTFLOW

FIGURE 8

Two aspects of the flow plan can not be completely represented by the typical conditions as shown in Figures 5 through 8. First, the continuation of high recreational flows out of McKay Station, after mid-September, would make it difficult to draw down the North Twin impoundment safely for spawning season. Because North Twin is downstream of Ripogenus, it is difficult to lower North Twin's elevation while high rafting flows are being released into the North Twin impoundment. In addition, the increased spillage at North Twin and further reduction of Ripogenus pond level due to the extension of recreation flows beyond mid-September would contribute to an appreciable loss of power to Great Northern. Therefore, although the agencies and MEPRO have requested that recreational flows continue into October, this request cannot be met: no commitment can be made beyond mid-September. At that point, it would be necessary to look at the flows from Ripogenus and the lake levels in Ripogenus and North Twin to determine flows at both locations to permit salmon and lake trout spawning to take place safely. For this reason, the Water Use Plan established September 15 as the date that the commitment on recreational flows would end.

Second, in order to provide a safe rate of drawdown at North Twin, from its summer level to its spawning elevation, the drawdown would have to start in mid-August. This would provide an average drawdown rate of 1.5 ft/wk or less and a maximum drawdown rate of no more than 2.0 ft/wk in any single week during the drawdown period, from mid-August to mid-October. To keep the summer elevation constant until the end of August would increase the



0033.0000

drawdown rate by almost 30 percent, well beyond the maximum historical drawdown rate of 1.6 ft/wk at North Twin.

Power Impact Analysis:

Figure 9 is a schematic of the power system at Great Northern. Having looked at the water use requirements, the water use flows, and the total available water, and having developed the Plan, Stone & Webster and Great Northern studied the operation of Great Northern's power system to determine whether the Water Use Plan can still satisfy the power requirements of the mill.

Figure 9 illustrates how complicated the Great Northern system is. The system has capacity available in hydro, cogeneration, condensing, and purchased power. The mill has both a 60-cycle load and a 40-cycle load. The 60-cycle power can be supplied from purchased power, condensing, cogeneration, and hydro. The 40-cycle power can be supplied from hydro, cogeneration and condensing. There is no way to purchase 40-cycle power. The hydro at McKay Station and Weldon Station, a portion of Millinocket, and a portion of Dolby are on the 40-cycle side, while 60-cycle generation is located at North Twin, Millinocket, Dolby and East Millinocket.

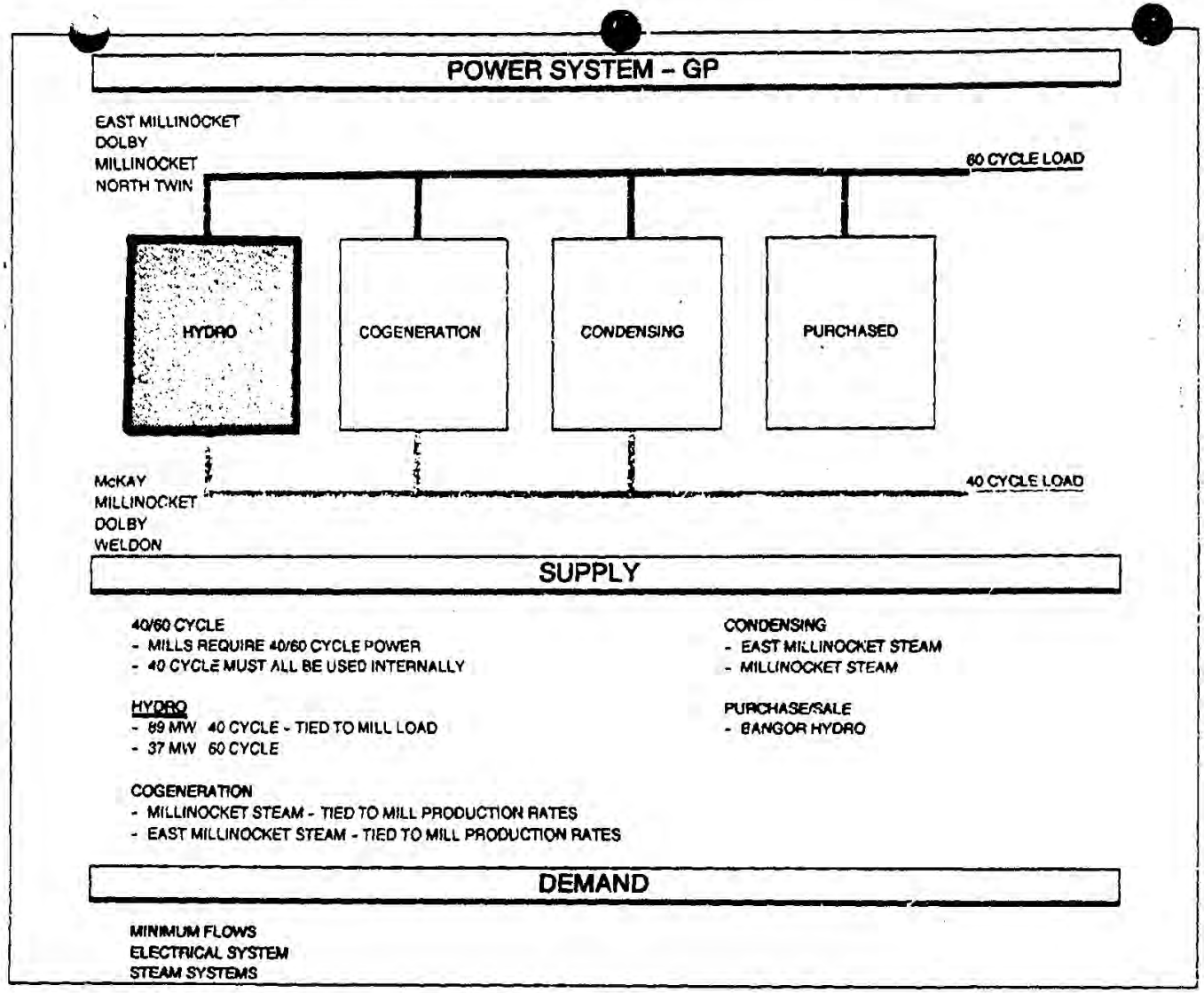

POWER SYSTEM – GP
EAST MILLINOCKET
DOLBY
MILLINOCKET
NORTH TWIN
60 CYCLE LOAD
HYDRO
COGENERATION
CONDENSING
PURCHASED
McKAY
MILLINOCKET
DOLBY
WELDON
40 CYCLE LOAD
SUPPLY
40/60 CYCLE
- MILLS REQUIRE 40/60 CYCLE POWER
- 40 CYCLE MUST ALL BE USED INTERNALLY
HYDRO
- 69 MW 40 CYCLE - TIED TO MILL LOAD
- 37 MW 60 CYCLE
COGENERATION
- MILLINOCKET STEAM - TIED TO MILL PRODUCTION RATES
- EAST MILLINOCKET STEAM - TIED TO MILL PRODUCTION RATES
CONDENSING
- EAST MILLINOCKET STEAM
- MILLINOCKET STEAM
PURCHASE/SALE
- BANGOR HYDRO
DEMAND
MINIMUM FLOWS
ELECTRICAL SYSTEM
STEAM SYSTEMS

FIGURE 9

On the supply side it is important to note that the mills require both 40 and 60-cycle power, and all the 40-cycle power must be used internally. It is impossible for Great Northern to sell 40-cycle power. Also, 89 megawatts of the hydro system is 40-cycle power that is directly tied to the mill load, which severely limits the operational flexibility of the power system, which must closely follow that mill load. There are 37 megawatts of hydro on the 60-cycle side.

On the demand side, given the sources of supply, the power system must maintain minimum flows, electrical system requirements, and the steam demands of the mill. All of these components are interrelated.

The power analysis determines the historical generation and sustained capacity of the hydro system. It then takes the proposed use of the system in the future pursuant to the Water Use Plan, analyzes it with the new flows, and determines the net change on the hydro system generation. This is the first step.

The analysis must then take the net change on the hydro system and analyze the reducing (cogeneration) power, the condensing steam supply, and the Bangor Hydro-Electric purchased power supply. Taking those sources available to Great Northern, including the complex interactions among them, the analysis determines whether the power system can adequately maintain the load to the mills.

Since the Water Use Plan has to maintain safety requirements and also incorporate measures which provide environmental and recreational benefits, some impact on power generation would be anticipated. Therefore, a negative impact on power generation would be expected.

Based on flow simulations of the 15-year period studied (1976-1990), the hydropower generation has been evaluated under the Water Use Plan. The degree of impact varies by year, depending on station characteristics and on available water conditions. The energy impact is discussed further in Section 1.5.1 of Exhibit H. The energy loss has a negative impact on Great Northern's operation. However, the adverse impact of the Water Use Plan is not solely economic. Meeting the commitments spelled out in the report greatly constrains Great Northern's operational flexibility and eliminates all capacity and operating reserves at certain times; it also tightly constrains when downtime and maintenance outages can be taken in the entire thermal and hydro system.

Details of Water Use Plan:

As the preceding discussion illustrates, this is a fully-integrated Water Use Plan. It identifies all of the requests made throughout the consultation period by the various agencies and special interest groups. It looks at all power demands, all available power supplies, and integrates all of these factors in a single flow/level management plan. The actual Water Use Plan is summarized in Table 2. Table 2 also provides the model outcome in greater detail than what was given in Table 1.

RIPOGENUS AND PENOBSCOT MILLS PROJECTS
WATER USE

| Waterbody | Agency Request | Reason | Time Period | Model Outcome |
|---|---|---|---|---|
| Ripogenus Impoundment | "relatively stable" water levels | wildlife wetlands, recreation, aesthetics | 1 May - 15 July<br>1 May - 30 Sept. | |
| West Branch Flow | 2,400 - 3,600 cfs | rafting | 1 May - 15 Oct. | |
| | ABF or Study | salmon fishery | 15 June - 30 Sept. | |
| | maintain flow/ elevation | salmon spawning<br>salmon incubation | 15 Oct. - 15 Nov.<br>16 Nov. - 7 June | |
| Upper Gorge Flow | 100 cfs<br>50 cfs | salmon fishery<br>salmon fishery | 1 July - 30 Sept.<br>1 Oct. - 30 June | |
| North Twin & Millinocket Lake Impoundments | "relatively stable" water levels | wildlife wetlands, recreation, aesthetics | 1 May - 15 July<br>1 May - 30 Sept. | |
| | drawdown limit | lake trout spawning<br>lake trout incubation | 15 Oct. - 5 Nov.<br>6 Nov. - 1 May | |
| Back Channel | 350 - 500 cfs | fishery habitat | year-round | |
| Millinocket Stream | 60 - 80 cfs | fishery habitat | year-round | |
| West Branch | 2,000 cfs instantaneously | water quality | year-round | |

TABLE 2

1. Ripogenus Impoundment Water Levels.

The first agency request was for relatively stable water levels in the Ripogenus impoundment. This was requested as an enhancement to wildlife, wetlands, recreation, and aesthetics during a time period from May 1 through September 30. Recognizing that this is indeed an integrated water use model and that all components are interconnected, the analysis determined that there are some things Great Northern can do and some things it cannot. Because Ripogenus is the principal source of water for the entire Great Northern hydro system, lake level controls at Ripogenus are inconsistent with fish management goals at Ripogenus and virtually all other benefits created by the Water Use Plan. Therefore, no lake level controls are possible or desirable there. As a result, the Plan proposes no specific change in the lake level management at Ripogenus or the other water bodies upstream of Ripogenus: there will be no significant change in the management of Ripogenus Dam and the small upstream storage impoundments. The limited modifications to the level of the Ripogenus impoundment are shown on Figure 10.

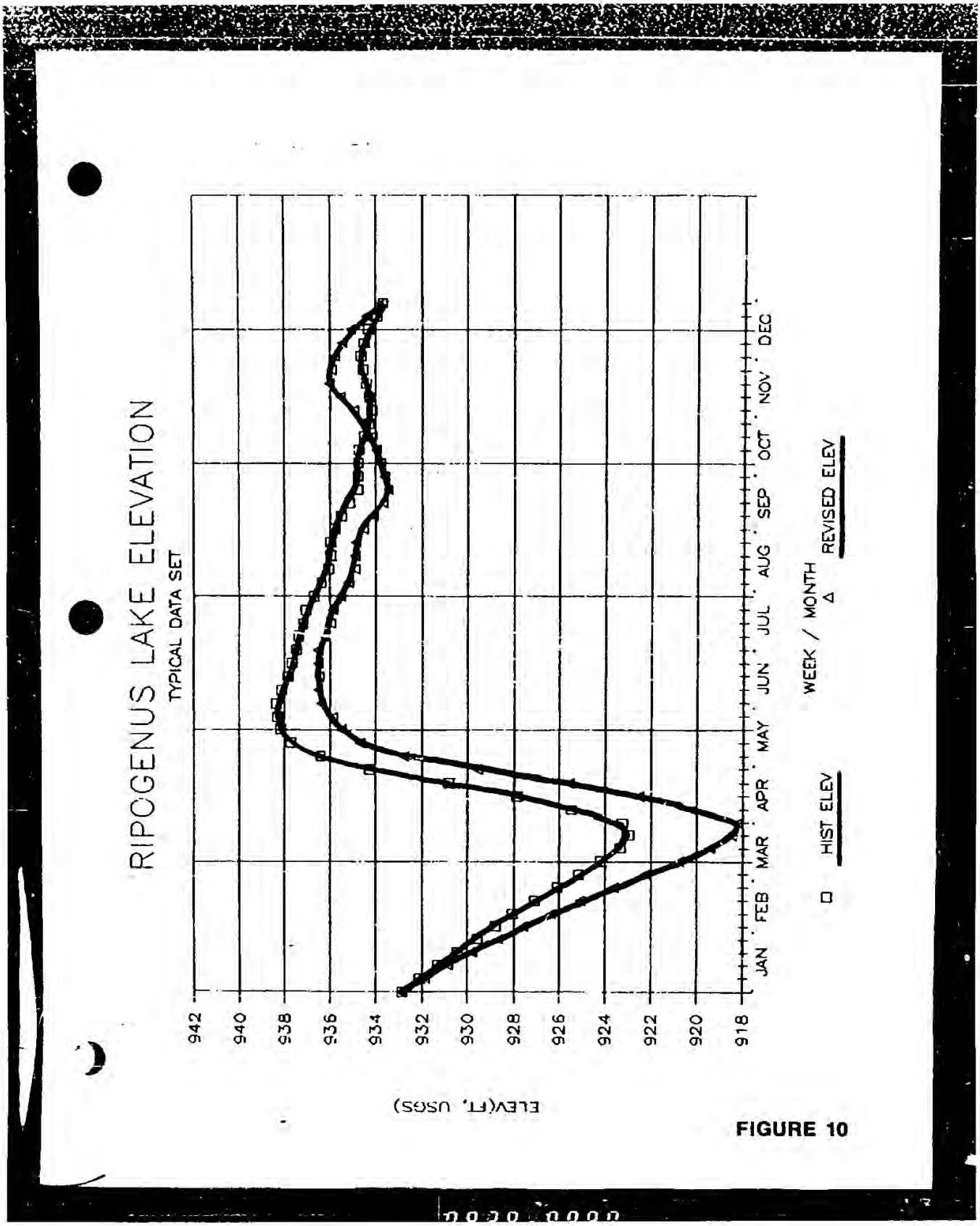

RIPOGENUS LAKE ELEVATION
TYPICAL DATA SET
ELEV(FT, USGS)
942
940
938
936
934
932
930
928
926
924
922
920
918
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
WEEK / MONTH
□ HIST ELEV
Δ REVISED ELEV

**FIGURE 10**

Although the Water Use Plan does not allow a significant change in operation of the Ripogenus impoundment, consultation with the United States Fish and Wildlife Service ("USFWS") and the Maine Department of Inland Fisheries and Wildlife ("MeDIFW") continued after second-stage consultation concerning the influence of drawdown on the surrounding wetlands. This is discussed in Exhibit E. Similarly, agency comments concerning recreational access to and use of the Ripogenus impoundment are addressed in Exhibit E in the final application.

2. Recreational Flows in the West Branch.

The agency and MEPRO request for recreational flows in the West Branch, was for 2400 to 3600 cfs from May 1 to October 15. The Water Use Plan meets this request by providing recreational flows of at least 2000 cfs downstream of McKay Station during normal months, and at least 1800 cfs during other months. Except as limited by public safety concerns or environmental requirements, these flows will be maintained from May 1 to September 15.

This is a significant improvement over the current situation, where there is no minimum recreational flow. Moreover, surveys of whitewater boating customers (discussed in Exhibit E) prove that the public's enjoyment of the rafting trip is not adversely affected

even if flows drop as low as 1800 cfs. In any event, these flows will ensure an adequate and satisfying raft trip.

As in the case of the Ripogenus impoundment, agency, MEPRO, and AWA comments regarding access to McKay Station, use of the put-in site, access fees, and take-out facilities are addressed in Exhibit E.

3. System Maintenance and Control Period.

From September 16 through October 14, Great Northern proposes a minimum flow of at least 400 cfs in the West Branch downstream of McKay Station. While actual flows are expected to exceed this level under most conditions, this period provides the ability to balance the hydro system before the critical lake trout and salmon spawning seasons. It is also during this period that Great Northern needs to control the outflow from McKay Station so that the downstream North Twin impoundment can be drawn down to provide enhancements at that impoundment, and to permit maintenance of the hydro and transmission systems.

4. Fishery Flows in the West Branch.

The agency request on West Branch flows is to maintain flow and elevation for spawning from October 15 to November 15, and for salmon incubation from November 16 to June 7. The Water Use Plan accomplishes

this by lowering the flows in the West Branch to narrow the spawning area between October 15 and November 15. During the incubation period, from November 16 to June 7, flows will be established based on actual flows occurring during the preceding salmon spawning period and will typically equal or exceed the salmon spawning flows. This will ensure that the redds remain protected.

This combination of spawning and incubation flows represents a distinct improvement over historical flow patterns. The flows are based upon 10 years of observation by Great Northern's fishery biologists of where spawning salmon actually constructed their redds.

5. Fishery Flows in the Upper Gorge.

The agencies requested Upper Gorge flows of 100 cfs from July 1 to September 30 for the salmon fishery and 50 cfs from October 1 through June 30. In the Upper Gorge, the Water Use Plan calls for providing the 100 cfs from July 1 to September 30. Leakage will be provided the balance of the year. This proposed minimum flow should be evaluated in conjunction with Great Northern's proposal to provide juvenile salmon habitat downstream of the McKay Station. This proposal replaces Great Northern's earlier proposal to release 50 cfs to provide habitat for juvenile salmon in the Upper Gorge. Juvenile habitat will be provided by the utilization of a now-

bypassed side channel downstream at Holbrook. This is discussed in Exhibit E.

6. Outage Flows Below McKay Station.

During any outage, Great Northern proposes to provide a minimum flow of 400 cfs in the West Branch downstream of McKay Station immediately after the outage to protect biological resources of the area. While not technically an "instantaneous" minimum flow, this flow will be provided by automating the station supervisory controls to permit release of flow directly into the river at McKay Station. Except during the period from September 16 to October 14, the biological minimum flow would not extend for a period greater than three consecutive days. Great Northern proposes to supplement the short-term biological minimum flow with releases from the dam to provide the following river flows during each pertinent season.

a. Recreation Season.

During the period May 1 to September 15, Great Northern proposes a recreational flow of 1,800 cfs during daylight hours in the West Branch downstream of McKay Station as soon as possible after the start of the outage. During the period May 1 to September 15, once the 1,800 cfs recreation outage flow has been established, Great Northern will release a ramped flow of 1,000 cfs during the

nighttime hours. The providing of these flows should have no significant impact on whitewater rafting on the lower river below Abol Bridge.

b. System Maintenance and Control Period.

During the period September 16 to October 14, Great Northern proposes a minimum flow of 400 cfs in the West Branch downstream of McKay Station. This will allow the North Twin impoundment to be drawn down to protect lake trout spawning and allow for system maintenance.

c. Salmon Spawning Period.

During the salmon spawning season (typically October 15 through November 15), Great Northern proposes a flow at least equal to the annual spawning flow range as soon as possible after an outage.

d. Salmon Incubation Period.

During the salmon incubation period (typically November 16 to June 7), Great Northern proposes a flow equal to or greater than 1300 cfs as soon as possible after an outage.

7. North Twin Impoundment Levels.

Moving to the North Twin and Millinocket Lake impoundments, the agency request was for relatively

stable water levels for wildlife, wetlands, recreation, and aesthetics from May 1 until September 30. As discussed above, Great Northern will provide relatively stable levels in the North Twin Impoundment from May 1 through August 15.

The drawdown limit for lake trout spawning will be reached by October 15 and maintained until November 5. To provide for lake trout incubation from November 6 to May 1, lake levels will be maintained above the spawning level. Thus, unless it is unable to maintain the 2000 cfs minimum flow, Great Northern will not draw North Twin down below that October 15 point and will build the lake level through the winter months, until the spring runoff refills the impoundment.

A critical component of this part of the Water Use Plan is that Great Northern must always maintain the 2000 cfs release, which takes priority. If there is not adequate inflow, North Twin may not reach the near full-pond elevation. Rather, the relatively stable summer level may be somewhat less than full pond.

In sum, the lake level will be brought down before the start of the spawning season on October 15. It will be held constant for three weeks, and then, through regulation, maintained above that elevation until the next spring fill.

8. Flows in the Back Channel.

In the Back Channel, the most recent agency or interest group request, as a result of the Second-Stage Consultation, was between 350 cfs and 500 cfs year-round for salmon habitat. Based upon the modelling effort as well as the cost of a significant spill to the Back Channel, Great Northern is not proposing any flows in the Back Channel. As indicated in all previous consultation meetings with the agencies, and as stated in the draft application, it is too costly to make such releases. Also, recognizing that this is an integrated Water Use Plan, providing the flows in the Back Channel would have an adverse impact on the ability to provide incubation flows for salmon on the West branch and stable lake levels in North Twin Lake, especially in dry years. A higher release from North Twin during dry periods would require a correspondingly higher spawning flow in the Upper West Branch. As the salmon spawning flow is increased, it becomes more likely that there would not be enough water available to maintain the incubation flows. This would have a negative impact on the salmon spawning.

9. Millinocket Stream.

In Millinocket Stream, the agency request was for between 60 and 80 cfs to protect salmon habitat year-round. The proposal in the Water Use Plan is 20 cfs. Again, recognizing that this as an integrated Water Use Plan, the 60 to 80 cfs in Millinocket Stream pursuant to

these agency requests would have an adverse impact on the ability to maintain lake level elevations at North Twin.

10. Flows Below Dolby.

Finally, the agencies have requested continuing the 2000 cfs minimum flow in the West Branch to maintain water quality year-round. This is also a condition of the corporate charter and of the license for Project No. 2458, each of which require a flow of 2000 cfs at Millinocket as long as water remains in storage upstream. The Water Use Plan proposes no change in that minimum flow at Millinocket.

Agency Consultation:

After the Water Use Plan was presented to the agencies and interest groups at meetings on February 25 and 26, 1991, a written report describing the plan was provided to all attendees on April 26, 1991. Only the National Park Service, the Maine Professional River Outfitters, and the Save Our Scenic Lakes Association provided written comments. These are discussed below.

Notwithstanding the lack of written comments from the other agencies, the Water Use Plan was discussed at numerous consultation meetings held after February 26, 1991. Minutes from these meetings are included in Exhibit E. This final version of the Water Use Plan reflects those discussions, including discussions held with the DEP on October 7, 1991.

1. Determination of "Wet" Versus "Dry" Years.

As requested by The National Park Service ("NPS"), Great Northern has clarified the Water Use Plan to indicate that the recreational flow for each month from May through September 15 will be made on the first day of each month. This determination will be based on an analysis of Total Available Water, as described in the Water Use Plan. The determination of "wet", "normal", or "dry" will remain constant during the month based on the first day of the month classification. The appropriate minimum recreational flow will be based on the Total Available Water determination.

The National Park Service also expressed concern over the time during which the Total Available Water would not be within the normal range. As discussed in the plan, the Total Available Water has a probability of being within the normal band 68 percent of the time and a probability of 32 percent of being outside this range. This distribution is based on the assumption that the available water can be approximated as a normal distribution.

The 15 years of historical data show the following occurrences:

| | |
|---|---|
| dry period | 21% |
| normal period | 61% |
| wet period | 18% |

This distribution shows a deviation from the normal distribution due mainly to 2 very dry years in the data set. For a longer period or record, it is anticipated that the data distribution would be expected to approach that of a normal distribution.

MEPRO indicated that it would prefer that the determination of whether dry or normal or wet conditions exist be made annually in June rather than monthly. MEPRO's concerns with monthly flow determination are, however, unfounded. As Great Northern demonstrated in the Water Use Plan and in the consultation meeting on February 25, 1991, the great variability in mass inflow volume makes it impossible to forecast flows for the entire rafting season. If Great Northern were required to do this, it would necessarily have to adopt a more conservative approach to deal with this variation. This would result in more "dry" year flows, and a greater likelihood of lower recreational flows throughout the summer.

Monthly determinations will affect the availability of rafting flows from September 1 to September 15, but the ultimate determinant remains Total Available Water, which is beyond anyone's control. The recreation interests will have available the determinations on the first of May, June, July, and August to make a judgement about likely September 1 conditions. As Great Northern

has explained in detail in the Water Use Plan and at the February 25 meeting, the need to draw the North Twin impoundment down prior to lake trout spawning makes it impossible to guarantee rafting flows after September 15. This would be true regardless of how often rafting flows are determined.

Contrary to MEPRO's fears, monthly flow determinations will reduce the frequency of lower flows because, as noted above, such determination would be less conservative than a single determination in June.

2. Frequency of Low Flows.

MEPRO indicates that it understands that two-thirds of the data from the 15 years of operation at Ripogenus was used for establishing the normal range of flows. This is not correct. In fact, each week of the entire 15 year data set is used in the analysis and two-thirds of this entire data set makes up the normal band.

In reply to the National Park Service's request that "Georgia-Pacific ['Great Northern'] should outline the circumstances that would require the curtailing of recreational boating flows out of Ripogenus after mid-September," Great Northern must first re-emphasize that its Water Use Plan has attempted to accommodate conflicting agency requests affecting this time period. For the West Branch below McKay Station, the request was

for recreational boating flows from May 1 to October 15. For the North Twin impoundment the request was for relatively stable water levels from May 1 to September 30, and for North Twin's elevation to be drawn down by October 15 to protect lake trout spawning.

Since safety is the highest priority of the Water Use Plan, and providing environmental and recreational benefits are respectively lower priorities, the safe drawdown of North Twin to protect lake trout spawning is the first consideration. In order to provide a safe rate of drawdown at North Twin, from its summer elevation to its spawning elevation, it was shown in the Water Use Plan that the drawdown of North Twin would have to start by mid-August.

The next step was to see if recreational boating flows could be released from Ripogenus, while North Twin was being drawn down, without affecting either the drawdown of North Twin or power generation, which is the overriding consideration for Great Northern. In running flow simulations of each of the 15 years in the data set it was shown that, under certain conditions, North Twin could not be drawn down in time without an appreciable loss of power at North Twin, in terms of forced spillage, caused by the release of recreational boating flows during the drawdown period at North Twin.

In 1981, for example, there was a large increase in natural inflow to North Twin during the drawdown period. A flow simulation performed for 1981 showed that large quantities of water had to be spilled at North Twin, during its entire 9 week drawdown period, so that minimum boating flows could be maintained at Ripogenus until October 15. It is because of these circumstances that Great Northern has established September 15 as the date that the commitment on recreational flows will end. The period from September 16 through October 14 has been set aside as the "System Maintenance and Control Period." It is during this period that Great Northern needs the ability to control flows, downstream of McKay Station, in order to balance the hydro system before the critical lake trout and salmon spawning seasons. In any event, it is clear that at least 96 percent of the paying rafting customers take their trips prior to September 15. Therefore, the impact of reduced flows after September 15 will be quite limited. Moreover, Great Northern will cooperate with rafting outfitters to attempt to identify in advance whether recreational flows will be available after September 15, thereby enabling the outfitters to reschedule or avoid scheduling trips that would have inadequate flows.

3. Clarification of Outage Flows.

In response to requests from the National Park Service and Maine Professional River Outfitters, Great

Northern has clarified the outage flows that will be released below McKay Station. These specific flows are described in the Water Use Plan.

4. Stable Water Levels.

In conjunction with the discussion of stable water levels in the Water Use Plan, the following is a response to the official comments from the Save Our Scenic Lakes Association ("SOSLA"). To the extent possible, the proposals outlined in the Water Use Plan addressed the initial concerns of the SOSLA. The SOSLA in its letter dated June 17, 1991, which provided comments on the preliminary Water Use Plan, stated that it was encouraged by the results of the modeling to enhance recreational use of the impoundment. From reading SOSLA's letter it is apparent that there may be some confusion regarding project operation and the Water Use Plan. In the first instance, SOSLA states that Great Northern should continue the modeling effort to address the issue of project impoundment drawdown for maintenance. Drawdown of the impoundment level does not result from normal maintenance but is in fact required to provide minimum flow downstream and to create storage capability to store the spring runoff. Great Northern, with the exception of very few occurrences and none in recent years, has not drawn down the level of the North Twin impoundment for maintenance at the project.

The SOSLA also asks that Great Northern reconsider its minimum flow proposals for the Back Channel and Millinocket Stream. Increased flows in these two reaches would reduce Great Northern's ability to provide relatively stable lake levels at North Twin, which was SOSLA main concern.

5. **Trial Implementation of Water Use Plan.**

In order to determine whether the Water Use Plan will be viable in practice, as opposed to in a model, Great Northern has operated its hydro system to the Water Use Plan since May 1991. This trial run has shown that the Plan, as described here, is viable if it is not modified further. The Plan imposes significant operational constraints, not only on the hydro system, but on the entire Great Northern power system and thus on the manufacturing processes as well. These constraints go beyond the increased cost of power, and include loss of necessary generating reserves, system instabilities, and tightly constrained scheduling of maintenance downtime for power generation equipment, the transmission system, and papermaking machinery. While Great Northern is confident that it can meet the commitments contained in this Plan, it cannot satisfy requests for additional flows in the Back Channel, Millinocket Stream; nor can it provide flows from McKay Station on an instantaneous basis. Any such requirements would destroy the viability

of the Water Use Plan and the Millinocket and East Millinocket Mills.

6. Issues Raised by the Maine Department of Environmental Protection.

In a post-consultation meeting request, the Maine Department of Environmental Protection (MEDEP) requested a meeting be held to present the Water Use Plan and to discuss two issues: (1) the littoral zone in the Ripogenus-Chesuncook-Caribou impoundment; and (2) flows in the "Back Channel" at Millinocket. The MEDEP was interested in limiting the drawdown of the Ripogenus impoundment to the extent possible, and introducing flows in the "Back Channel".

The Water Use Plan was presented to the MEDEP on October 7, 1991. The presentation demonstrated that the ability to drawdown the Ripogenus impoundment must be maintained in order to provide flood control benefits and the water needed to meet the downstream environmental and recreational benefits. The lack of available drawdown would waste water that could be stored for subsequent beneficial release and would result in much larger flow variations due to the inability to use the reservoir for the regulation of flow. It was demonstrated that the proposed operational plan, which continues the existing drawdown mode of the Ripogenus impoundment, would need

to be continued in the future to maintain the downstream salmon and lake trout fisheries and recreational flow enhancements.

The presentation also discussed in detail the interaction between the salmon spawning flow, the North Twin minimum flow release, and the North Twin drawdown for lake trout spawning. As discussed at the meeting, the Ripogenus discharge normally makes up a majority of the North Twin impoundment inflow, and during some dry periods would provide nearly all of the North Twin inflow. Therefore, further increases in the North Twin discharge to support flow in the Back Channel would result in corresponding increases to the required salmon spawning flows upstream at the Ripogenus project. As the spawning flow is increased, it becomes more likely that there will not be enough water to maintain the salmon fishery during the entire incubation season since there will not be enough inflow and available storage to meet the flow requirements. It was demonstrated that further releases from North Twin to support flow in the Back Channel could not be achieved without an associated adverse environmental impact to the proposed salmon and lake trout fisheries and recreational flow enhancements.

The environmental impacts that can result from these two issues, as discussed above, are demonstrated on Figures 11 and 12.

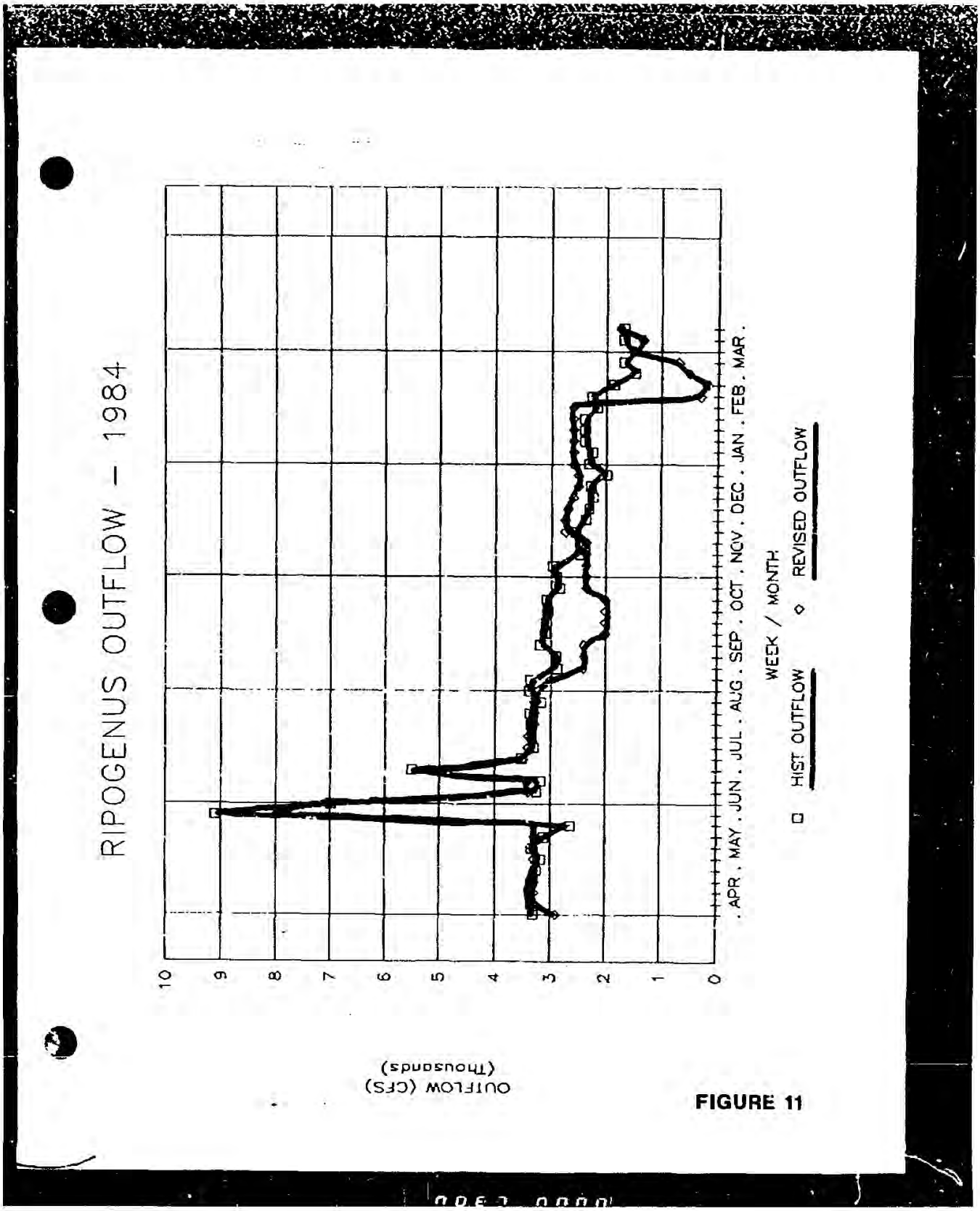

RIPOGENUS OUTFLOW - 1984
OUTFLOW (CFS)
(Thousands)
10
9
8
7
6
5
4
3
2
1
0
. APR . MAY . JUN . JUL . AUG . SEP . OCT . NOV . DEC . JAN . FEB . MAR .
WEEK / MONTH
□ HIST OUTFLOW
◇ REVISED OUTFLOW

**FIGURE 11**

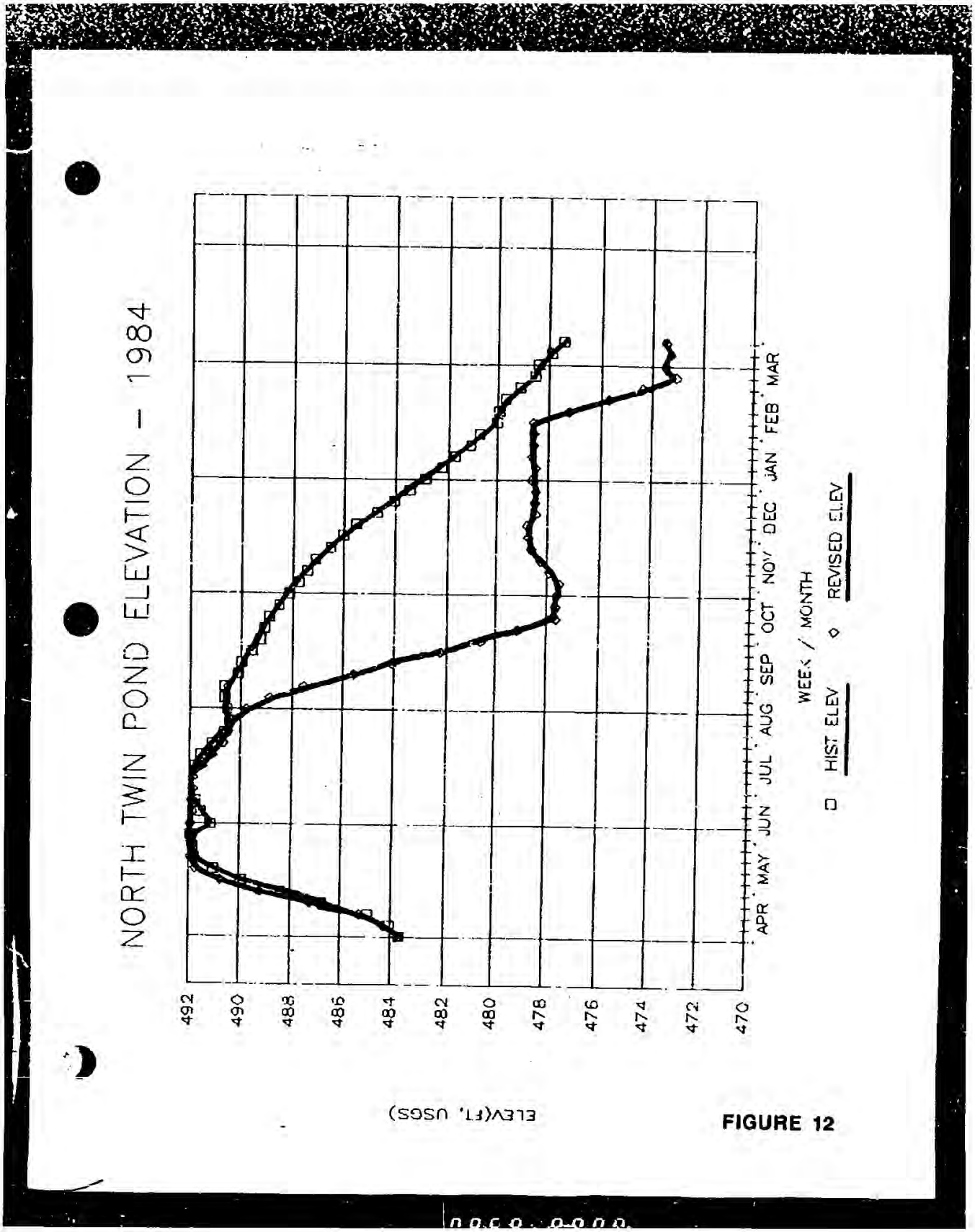

NORTH TWIN POND ELEVATION - 1984
ELEV(FT. USGS)
492
490
488
486
484
482
480
478
476
474
472
470
APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR
WEEK / MONTH
HIST ELEV
REVISED ELEV

**FIGURE 12**

Figure 11 is a graph of the Ripogenus outflow and it demonstrates what can happen to the salmon fishery if there is no water available to maintain the incubation flow below Mckay Station. The revised outflow, shown in red, drops off abruptly towards the end of February to a level far below the spawning flow which was set on October 15. This reduced flow during the incubation season would endanger the salmon fishery. There are two reasons why there would not be adequate water available for incubation flows at Ripogenus; first, the restriction on the drawdown of Ripogenus would simply limit the amount of water that could be drawn from storage to maintain flows; and second, the higher flows being released from Ripogenus during the year to allow releases in the Back Channel would cause the reservoir to drop more rapidly resulting in less water being available in storage at the start of the spawning season. In these cases, there would not be adequate storage available to supplement the low available winter inflows to maintain the salmon fishery.

Figure 12 is a graph of the North Twin Pond elevation. The revised elevation, which is shown in red, demonstrates what would happen at North Twin once the outflow from Ripogenus is restricted. North Twin's elevation immediately falls below its spawning elevation,

and the lake trout fishery is compromised in order to maintain the minimum flow downstream.

There are also two aspects of flow regulation which would have an impact on energy production and on the other water uses due to minimum flow requirements. First, in order to discharge water into the Back Channel, one or more waste gates must be opened at Stone Dam. The gates are manually operated and it would be necessary to set the gate openings so that they would release the required minimum flow for normal headpond conditions. To account for daily lake level fluctuations and accuracy of gate settings, it would be necessary to set any gate opening so that the average outflow down the Back Channel would be approximately 35 cfs higher than the minimum outflow required since the actual discharge varies based on the head on the gate and the opening set by the operator. This flow regulation effect would require an additional average flow rate of 35 cfs from the upstream North Twin impoundment in order to meet the minimum flow requirements at the Back Channel.

Second, the weekly average outflows used in the modelling of the discharge from the North Twin impoundment and from Millinocket Mill are assumed to be equal in the Water Use Plan. Historical flow records show that weekly average outflows from North Twin and Millinocket are approximately equal, but that an average

daily variation of plus or minus 130 cfs exists under normal conditions. This daily flow variation is due inpart to mill power demands and the 40/60 Hz load balance and is expected to increase with the implementation of the constraints of the Water Use Plan. The control equipment used to establish and regulate the flows through the project facilities also has a normal range of sensitivity that needs to be accounted for in the flow regulation. This daily flow variation means that in order to supply a certain minimum flow to Stone Dam, it is necessary to release a weekly average flow from North Twin that is greater than that minimum flow. This flow regulation requirement is not considered explicitly in the current modelling work and Great Northern believes it can meet the requirements of the proposed plan. However, any increases in minimum flow from the North Twin impoundment would push the model beyond its predictable limit. The work completed to date indicates that with increased flow there would be significant adverse impacts in both the fishery and recreational flow provisions of the Water Use Plan and the energy losses.

**Conclusion:**

The process of modelling Great Northern's hydro system to develop this Water Use Plan has shown that it will be possible to alter the operation of the Ripogenus and Penobscot Mills Projects to meet numerous agency requests for environmental enhancements

without imposing an unacceptable economic penalty on Great Northern's manufacturing operations. The modelling exercise also shows, however, that some agency requests, particularly those relating to flows in the Back Channel, cannot be met without destroying the Water Use Plan and having an unacceptable economic impact.

Great Northern is aware of no other modelling effort of similar scope or complexity. This Water Use Plan accomplishes the best achievable balance of often conflicting agency and licensee goals, and in so doing, certainly achieves the "equal consideration" mandated by the Federal Power Act.

Brookfield
Renewable U.S.

January 8, 2024

***Via eFiling***

Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Postponed: Operations Model Technical Workshop**

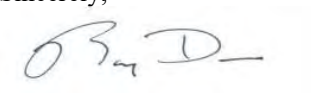
Dear Secretary Reese:

Great Lakes Hydro America, LLC (GLHA), Licensee of the Ripogenus Hydroelectric Project (No. 2572) and the Penobscot Mills Hydroelectric Project (No. 2458) (collectively referred to as the "Projects"), herein is providing notification that the Operations Model Study Technical Workshop scheduled for January 10-11, 2024 is postponed to a later date due to forecasted inclement weather on January 9-10, 2024, which may result in difficult travel conditions and power outages.

GLHA is in the process of identifying new dates to conduct the Operations Model Study Technical Workshop and will file an updated letter with FERC as soon as that information becomes available.

If you have any questions regarding this information, please contact me by phone at (207) 775-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman, Licensing Manager
Brookfield Renewable

cc: Relicensing Distribution List

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

Brookfield
Renewable U.S.

January 15, 2024

***Via eFiling***

Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Rescheduled Operations Model Technical Workshop**

Dear Secretary Reese:

Great Lakes Hydro America, LLC (GLHA), Licensee of the Ripogenus Hydroelectric Project (No. 2572) and the Penobscot Mills Hydroelectric Project (No. 2458) (collectively referred to as the "Projects"), herein is providing notification of the rescheduled date for the upcoming Operations Model Study Technical Workshop to be hosted by GLHA.

The workshop will be held ***in-person*** at the **Maine Department of Environmental Protection (MDEP) Office located at 106 Hogan Road, Suite 6 (3rd Floor) in Bangor, Maine** over two consecutive days, on January 31 and February 1, 2024.

In order to plan accordingly, GLHA respectfully requests stakeholders who plan on attending the workshop RSVP by contacting Cate Russell at Cate.Russell@hdrinc.com or (207) 239-3792 at your earliest convenience but no later than January 26, 2024.

The anticipated agenda for the workshop is provided below.

## Wednesday, January 31, 2024 (9:00 AM to 4:00 PM)

1. Logistics, Safety, and Introductions
2. Meeting Purpose
3. Relicensing Schedule
4. Overview of Operations Model
5. Hydrology
6. Lunch on your own
7. Overview of Projects and Operations
8. Model Verification
9. Overview of Baseline Scenario

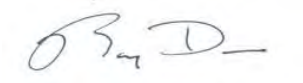
**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

**Thursday, February 1, 2024 (9:00 AM to 12:00 PM)**

1. Baseline Scenario Compared to Historic Operations
2. How to Request an Alternative Operating Scenario
3. Overview of Interpreting Model Run Results
4. Next Steps

If you have any questions regarding this information, please contact me by phone at (207) 775-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman, Licensing Manager
Brookfield Renewable

cc: Relicensing Distribution List

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

**Federal Agencies**

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Shannon McCrory
Deputy District Manager
Northeastern States
Bureau of Land Management
250 E. Wisconsin Avenue
Milwaukee, WI 53202

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Debbie-Anne A. Reese
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

Leonard Rawlings
FERC Coordinator
Eastern Region
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Karen McGuire
New England Region 1
Deputy Regional Administrator
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

**State Agencies**

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Kyle Olcott
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Peter Jamieson
Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
40 Western Avenue
E.S. Muskie Federal Building, Room 412
Augusta, ME 04330

Stacey Guerin
State Senator
3 State House Station
Augusta, ME 04333

Kathy Irene Javner
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, Maine 04333

Trey Stewart
State Senator
3 State House Station
Augusta, ME 04333

James Lee White
State Represenative
House Minority Office
Room 332, State House
2 State House Station
Augusta, ME 04333-0002

**Native American Tribes**

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Rena Newell
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

**Additional Parties**

Dr. Andrew Fisk
Northeast Regional Director
American Rivers

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Jesika Lucarelli
Great Mountain Guide Service
greatmountaings@gmail.com

Mark Nadeau
International Association of Machinists
245 Pamola Park
Millinocket, ME 04462

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Director
Maine Professional River Outfitters
PO Box 669
Millinocket, ME 04462-0669

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing
mary@mxhmarketing.com

Matt Polstein
New England Outdoor Center
matt.polstein@gmail.com

Suzie Hockmeyer
Co-founder
Northern Outdoors, Inc.
1771 US Rt 201
The Forks, ME 04985

Michael Smith
Outdoor Sport Institute
176 Highland Ave
Millinocket, ME 04462

Kenny DeCoster
Vice President
Penobscot Paddle and Chowder Society
towhee17@gmail.com

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Allison Economy
Representative for Allagash Gateway
Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Thomas Nannery
Sportsman's Alliance of Maine
205 Church Hill Rd
Augusta, ME 04330-9801

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Brian Stranko
Maine Program Manager
Trout Unlimited
brian.stranko@tu.org

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,
sharon.klein@maine.edu

Dean Beaupain
dean@bloomerrussell.com

Jeff Fayle
jfayle@gmail.com

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti
granby@cox.net

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris
nsharris@mgh.harvard.edu

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Christopher Howe
funpow89@yahoo.com

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Charles Paone
cpaonejr@gmail.com

Richard Parkes
Rparkesbb3@yahoo.com

Edward Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Robert Van Deventer
bobvnert@gmail.com

Wes Zemrak
2 Brookside Drive
Falmouth, ME 04105

Debbie-Anne Reese,
January 21, 2024
Secretary
Federal Energy Regulatory Commission 888 First Street, N.E., Room 1A
Washington, DC 20426

**Subject:** Ripogenus and Penobscot Mills Hydroelectric Projects (P-2572 and P-2458) Comments on Maine TU Council's Response to Great Lakes Hydro America filing of December 19, 2023 and issues raised by the Operaı ons Model and the Proposed January 30, 2024 Workshop.

Dear Secretary Reese: Via Electronic Filing

This filing is made as an addendum to Mr. Steven Heinz's filing of January 5, 2004. We live in an age of remote communicaı ons that has become a part of the everyday workplace. The Licensee has refused the very reasonable request for remote access to the rescheduled January 30 – February 1, 2024, Workshop. Therefore, I am expanding on comments made in my November 8, 2023, filing. These comments concern input data and logic used in the Operaı on Model (Ops model) presented in the Licensee's April 24, 2023, filing.

The Licensing of the above referenced Projects uses the Integrated Licensing Process. The Licensee states "GLHA believes that the ILP will be the most effecı ve and efficient process for these proceedings" (Pre-Applicaı on Document 1-0). The effecı veness and efficiency of the process is unknown at this time. What is known are the communicaı on difficulı es the stakeholders have had geı ng their quesı ons and concerns to the Licensee, and more importantly, receiving the Licensee's responses. The Licensee's December 19, 2023, response references "*24 separate studies to evaluate the Projects' impacts*". To my knowledge, none of these studies incorporated stakeholder requests concerning locaı ons and methods, and "rouı ne consulta. ons" (Randall Dorman 19, 2023 letter to FERC) are lacking. As a result, the only method of communication in responding to the Licensee's filings, is additional filings. While some filings may seem redundant and probably are redundant, FERC filings are the only instrument available to the stakeholders. There are many environmental and recreational issues. There is no indication that stakeholder questions and concerns are being heard. The case in point is the soon to be rescheduled Operation Model workshop, a key focus, perhaps the major focus of these two relicensing events. The Operations Model is the Licensee's study, and it is their prerogative to schedule when and where to hold a workshop. Remote communications are not being provided and the present schedule excludes me, other stakeholders, and perhaps agencies from distant locations. If the stakeholders and agencies

cannot participate in the Ops Model workshop, in effect we are removed from the licensing process of the two referenced Licenses.

The Licensee states that the Ops Model is a tool that can be used to determine if various storage, flows, and environmental goals can be met under various climate and hydrologic conditions. While this is a reasonable goal, input data e.g. estimated flows and impoundment elevations are flawed. As a result, figures and tables presented in Appendix B (April 24, 2023, Filing) have little or no bearing on actual flow and elevation outcomes.

As noted before, HDR expended a great deal of effort in developing the Operations Model. Regarding errors, omissions, and logic issues, I find fault with the logic and input of data that were the responsibility of the Licensee.

The errors or omissions in data use and logic are listed below.

The Licensee uses North and South Branch Gaging Stations in Appendix B, Section 4.0 Hydrology (Figure 4.1) but has gone at great lengths to avoid the use of the non-impounded North Branch
of the Penobscot River (North Branch) USGS gaging station flow records in other cases. Rather than use local and reliable stream flows, the Licensee spends a number of pages attempting to justify the use of the USGS Grindstone Gaging Station on the East Branch of the Penobscot River (East Branch) and its tributary Seboeis River to develop an estimate of tributary flow into the Storage Project (P2634). Both locations are on the lee side of the Appalachian Mountain range and would likely receive greater participation. Both rivers have impoundments. The East Branch is heavily impounded, and headwater flow is provided from the St John River drainage (though the Lock Dam diversion). The Seboeis River drainage is small and the period of record, five years, is short.
There is a dam on Sawtelle Brook and a structure on Jerry Brook (see Google Earth), tributaries to the Seboeis River. These are small but never-the-less provide hydraulic control.

One of principle attributes of Ops Model runs presented as figures in Appendix B is spring inflow into the storage ponds. As Storage Project spring gate setting requires manning (at some point during spring thaw), gate openings and pond elevations are known and provide some empirical data. Should the Licensee continue to insist on the use of flawed estimates of inflow rather than empirical recorded USGS North Branch flows, some error statement associated with East Branch and Seboeis Rivers flow estimation should be included.

The Licensee continues to use 939 ft as the Ripogenus full Pond Elevation. The Licensed full Pond elevation is 941.6. If the Licensee's position is that the 941.6 ft full pond elevation contains risks unacceptable at the corporate level, FERC should be notified of these risks. Upon receipt of the Licensee's full pond policy, FERC can incorporate this restriction into the new Ripogenus Project License. It is difficult to imagine a water management plan and hydroelectric market driven operations that gives up almost 3 BCF of storage associated with a dam designed to meet the Possible Maximum Flood.

The Licensee refers to snowpack surveys. No information is provided as to annual spring snowpack/"water on the ground" surveys. If the Licensee is using these data, then collection methods dates, and location should be provided. More importantly, the Licensee should explain how snowpack information is currently incorporated into a "rule curve" as well as how it was included in the Ops model.

5.2.3 Operational Settings

5.2.3.1 Spill Elevations

I understand that this is a model and certain conditions and rules are necessary. However, "*spill is set to occur at times during periods when the pond level is below full*" makes no sense. When available storage exists, why would the system operator preemptively release valuable water before the forecasted event occurs? Even in the most extreme rain event, it takes hours for pond elevations to rise, more than adequate for the system operator's response. This is NOT how the system was historically operated!

8.0 Model Summary and Conclusions

**Storage Pond – "***The Operations Model utilizes a single rule set for the Storage Ponds (Appendix B-9) for every year, where actual operations vary from year-to-year depending on actual conditions and timing of access".* What is a "single rule set"? If this rule set was defined earlier, I remain confused as to the development of parameters and how this rule is applied. For example, regarding Canada Falls and the downstream South Branch of the Penobscot River, was the river flow derived from the USGS (South Branch) Gage Station or were outflows derived from a universal inflow model?

Any water management plan will inherently contain conflicts caused by competing goals. In the case of the Storage, Ripogenus, and Penobscot Mills Project License Articles provide explicit requirements that conflict with elevation, flow, and environmental goals. A difficult challenge. I understand that model runs presented in Appendix B are simply examples. The Holbrok Bypass Channel (Article 406) and stable base flows were the prime fish and aquatic communities' goals of the 1996 Ripogenus Project licensing procedure. I found no reference or attempts to include Article 406 flow needs in iterations presented in Appendix B. Furthermore, It is clear that Article 406 Holbrook Bypass Channel flow requirements cannot be met during "normal" or "dry water years" under the Licensee's stated goal of continuing its extreme (daily 3500 cfs, 12-16 hour) peaking operation. The historic and projected violations of the Ripogenus Project's Article 406 should be acknowledged, and alternate Landlocked salmon spawning and incubation habitat(s) investigated now, rather than later.

The Licensee has stated they can and will produce various model runs set to meet a variety of conditions. If logic and input data are not corrected the value of these iterations is lost. Any flow model must demonstrate which fish and aquatic communities' needs can or cannot be met under various operational flows and impoundment drawdown scenarios. As stakeholders are

DRAFT

being denied remote access, their understanding of the modeling process, questions, and concerns will remain outside of the collaborative process.

Thank you for the opportunity to comment.

Ed Spear

307 Mt Hope Ave
Bangor, Me 04401
Email: edspear1@yahoo.com
Phone: 207-217-4288

CC: FERC Office of Public Participation OPP@ferc.gov

DRAFT

Brookfield
Renewable U.S.

January 23, 2024

***Via eFiling***

Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Operations Model Technical Workshop**

Dear Secretary Reese:

Great Lakes Hydro America, LLC (GLHA), Licensee of the Ripogenus Hydroelectric Project (No. 2572) and the Penobscot Mills Hydroelectric Project (No. 2458) (collectively referred to as the "Projects"), herein is providing notification of the opportunity for stakeholders to participate in the upcoming Operations Model Study Technical Workshop via a virtual option.

Consistent with the previous notices regarding the workshop, the workshop will be held *in-person* at the Maine Department of Environmental Protection (MDEP) Office located at 106 Hogan Road, Suite 6 (3rd Floor) in Bangor, Maine over two consecutive days, on January 31 and February 1, 2024.

Given the purpose, format, and duration of the workshop (i.e., educate the relicensing participants on the technical aspects of the operations model), GLHA continues to recommend that stakeholders attend the workshop in person, and hopes that those individuals who have indicated that they will attend the meeting in person will do so in lieu of attending the workshop virtually.

**In order to plan accordingly, GLHA respectfully requests stakeholders who plan on attending the workshop in person or virtually RSVP by contacting Cate Russell at Cate.Russell@hdrinc.com or (207) 239-3792 at your earliest convenience but no later than January 26, 2024.**

The anticipated agenda for the workshop is provided below. GLHA will work to complete presentation of the Day 1 information on January 31st as scheduled; however, as necessary, information from Day 1 may carry over to February 1st.

**Wednesday, January 31, 2024 (9:00 AM to 4:00 PM)**

1. Logistics, Safety, and Introductions
2. Meeting Purpose
3. Relicensing Schedule
4. Overview of Operations Model
5. Hydrology
6. Lunch on your own
7. Overview of Project and Operations
8. Model Verification
9. Overview of Baseline Scenario

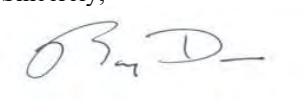
**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

**Thursday, February 1, 2024 (9:00 AM to 12:00 PM)**

1. Baseline Scenario Compared to Historic Operations
2. How to Request an Alternative Operating Scenario
3. Overview of Interpreting Model Run Results
4. Next Steps

If you have any questions regarding this information, please contact me by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman, Licensing Manager
Brookfield Renewable

cc: Relicensing Distribution List

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

**Federal Agencies**

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Shannon McCrory
Deputy District Manager
Northeastern States
Bureau of Land Management
250 E. Wisconsin Avenue
Milwaukee, WI 53202

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Debbie-Anne A. Reese
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

Leonard Rawlings
FERC Coordinator
Eastern Region
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Karen McGuire
New England Region 1
Deputy Regional Administrator
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

**State Agencies**

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Kyle Olcott
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Peter Jamieson
Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
40 Western Avenue
E.S. Muskie Federal Building, Room 412
Augusta, ME 04330

Stacey Guerin
State Senator
3 State House Station
Augusta, ME 04333

Kathy Irene Javner
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, Maine 04333

Trey Stewart
State Senator
3 State House Station
Augusta, ME 04333

James Lee White
State Represenative
House Minority Office
Room 332, State House
2 State House Station
Augusta, ME 04333-0002

**Native American Tribes**

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Rena Newell
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

**Additional Parties**

Dr. Andrew Fisk
Northeast Regional Director
American Rivers

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Jesika Lucarelli
Great Mountain Guide Service
greatmountaings@gmail.com

Mark Nadeau
International Association of Machinists
245 Pamola Park
Millinocket, ME 04462

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Director
Maine Professional River Outfitters
PO Box 669
Millinocket, ME 04462-0669

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing
mary@mxhmarketing.com

Matt Polstein
New England Outdoor Center
matt.polstein@gmail.com

Suzie Hockmeyer
Co-founder
Northern Outdoors, Inc.
1771 US Rt 201
The Forks, ME 04985

Michael Smith
Outdoor Sport Institute
176 Highland Ave
Millinocket, ME 04462

Kenny DeCoster
Vice President
Penobscot Paddle and Chowder Society
towhee17@gmail.com

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Allison Economy
Representative for Allagash Gateway
Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Thomas Nannery
Sportsman's Alliance of Maine
205 Church Hill Rd
Augusta, ME 04330-9801

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Brian Stranko
Maine Program Manager
Trout Unlimited
brian.stranko@tu.org

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,
sharon.klein@maine.edu

Dean Beaupain
dean@bloomerrussell.com

Jeff Fayle
jfayle@gmail.com

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti
granby@cox.net

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris
nsharris@mgh.harvard.edu

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Christopher Howe
funpow89@yahoo.com

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Charles Paone
cpaonejr@gmail.com

Richard Parkes
Rparkesbb3@yahoo.com

Edward Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Robert Van Deventer
bobvnert@gmail.com

Wes Zemrak
2 Brookside Drive
Falmouth, ME 04105

Ms. Kimberly D. Bose
Secretary Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

January 25, 2024

Subject: Comments on historic and contemporary Salmon fishing quality in the West Branch Penobscot River (FERC No. P-2572-133)

I am writing to express my opposition to what I understand to be the current peaking operating mode occurring in the West Branch Penobscot River downstream from McKay Station. By way of background, I am familiar with the historical fishery occurring in this river. I attended the University of Maine at Orono (UMO) from 1967-1973 and was employed under a contract involving the US Fish and Wildlife Service and the Migratory Fish Research Institute (MFRI) at UMO from 1974 until 1977. While under the auspices of the MFRI I authored a report entitled "Mattawamkeag River Studies: 1. Biological and physical factors bearing on restoration of Atlantic Salmon in Mattawamkeag River, Penobscot River System, Maine and 2. Effects of Sevin, a spruce budworm insecticide on fish and invertebrates in the Mattawamkeag River in 1976". I actively fished the West Branch Penobscot River below McKay Station many times annually from 1971 until I left the State of Maine in 1977. This time period predates the development of what is now a vibrant recreational whitewater rafting/boating industry in this river.

Upon departing Maine I moved to New York and was employed as a fisheries biologist for 39 years by the New York State Department of Environmental Conservation (NYSDEC) until my retirement in 2016. During my tenure at NYSDEC I held various positions, the last being as Chief of the Bureau of Fisheries in the Division of Fish, Wildlife and Marine Resources. Professionally I interacted with fisheries personnel frequently, often those from the Northeast United States. Through those interactions and a focus on coldwater fisheries (salmon and trout for example) during significant portions of my career, I became quite familiar with the types and quality of coldwater fisheries available in various Northeast states. Hyperbole can often be used to emphasize a point; however, it is not hyperbole to state that the Atlantic Salmon (landlocked) population and fishery of the West Branch Penobscot River downstream of McKay Station was exceptional among fisheries for that species in the Northeast States. The ecosystem and its management regime supported a self-sustaining, wild salmon population that provided high quality fishing opportunities throughout the open-water angling season. By way of contrast, seasonal (parts of the spring and fall) fishing

opportunities for primarily stocked (hatchery reared) Atlantic Salmon in portions of rivers associated with lakes such as Lake Champlain or Lake Ontario are more common, though special in their own right. I do not state or imply that I am an expert on the current state of the ecosystem or fishery present in the West Branch Penobscot River. I have however read many of the filings to FERC pertinent to P-2572 and see the following as critical stakeholder issues and concerns.

The Salmon Population and fishery. Individuals familiar with the contemporary fishery contend in letters to FERC that the fishery has declined in quality relative to that of earlier years. If present in the voluminous filings, I did not see one letter along the lines of "the fishery is better than it used to be". Salmon growth rates, which have declined per Edward Spear's letter of September 27, 2023, and overall abundance are apparently not what they once were. Total angling effort in recent years remains unquantified as there are no statistically valid estimates of angler effort and catch. Unfortunately this precludes the ability to say that this fishery now supports X days of angler effort annually that in turn leads to Y dollars of economic impact to local communities and to the State of Maine. The ability to make statements of this nature can be a powerful tool in protecting aquatic resources.

It is possible however to make reasoned inferences about the current quality of the Salmon fishery based on information contained in several comments provided to FERC. Creel survey data obtained from 1979-1987 for the McKay Station to Abol Bridge reach are presented in a letter submitted by Edward Spear on July 6, 2023. Creel surveys are employed to obtain estimates of angler effort and catch by systematically obtaining counts of anglers, conducting contact interviews to obtain data from all anglers on fish caught including those kept and those released, and expanding those data to account for days that were not sampled by the creel survey clerk. The mean catch of Salmon (fish kept plus those released) was just over 11,000 fish per year from 1979-1987. Included in that number was an average of 1,317 legal sized fish per year that were retained (creeled) by anglers. On a per angler basis, the overall mean catch rate was 1.79 salmon per angler day or 0.49 salmon per angler hour during this time interval.

Angler catch and effort information were obtained in 2021 and 2022 on a voluntary basis from anglers reporting trip data in survey boxes deployed at various sites downstream from McKay Station (Maine Department of Inland Fisheries and Wildlife {MEDIFW}, comments to FERC June 29, 2023). Angler survey boxes are a management tool, dependent upon voluntary cooperation, designed to detect trends over time. Those self-reported data tend to have a positive bias towards more successful anglers (MEDIFW, same comments). The reported catches of Salmon in 2021 and 2022 were 0.76 and 0.99 fish per hour respectively. The catch rate for 2021 reflects an apparent typo. Based on the tabular data presented in that comment letter however, the actual catch rate for Salmon in 2021 should have been 0.56 fish per hour (864 Salmon

reported caught in 1,545 hours). It is worth noting that based on the 2021 and 2022 data, the fishery described functioned as a virtual “no-kill” with only one fish reported as kept or creeled, and about 20% of the reported catch being 16 inches or larger. A “no-kill” fishery (in practice or in regulation) should maximize the overall catch rate as legal harvest is minimized, and should also favor retention of larger fish in the overall population. Contrast that with more than 1,300 legal size Salmon kept on average annually from 1979-1987.

Although angling regulations, sample sizes, and the data collection methodologies cited above differ between time periods, other quantitative catch and effort information is not apparently available. The data are consistent with observations from various persons submitting comments that the fishery, particularly for larger fish, has declined. What happened? One possible explanation is the difference in overall operating procedures in current as opposed to prior times when McKay was integral to the operation of two nearby paper mills. Whereas daily flows through McKay were relatively stable many years ago, now it is more common for daily pulsing of flows to occur nominally to facilitate whitewater boating recreation (Maine Council of Trout Unlimited comments filed May 12, 2022). I believe that a return to the more stable flows (and attendant impoundment water level management) of prior years would be beneficial to the Salmon fishery of the West Branch Penobscot River downstream from McKay Station, could easily accommodate the vibrant whitewater recreational boating industry while also providing electricity to consumers.

Thank you for the opportunity to provide comments on these important matters.

Philip J. Hulbert
895 Brickhouse Hill Rd.
East Meredith, NY 13757

Ms. Kimberly D. Bose
Secretary Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

February 1, 2024

Subject: Support for installation of a stream flow monitoring gauge for the West Branch Penobscot River (FERC No. P-2572-133)

I am writing to express my support for the installation of a flow monitoring gauge in the West Branch Penobscot River downstream of, but in close proximity to McKay Station. The need for a gauge was identified, for example, in a filing by the Maine State Council of Trout Unlimited dated November 9, 2023. Key attributes of such a gauge should include independence from the license applicant, real time data accessibility (ie. internet accessibility) and installation/maintenance by an entity with demonstrated expertise in such matters. The logical choice for siting, installing, and operating a stream flow gauge is the United States Geological Survey (USGS). According to the USGS there are currently 16 stream flow gauges in the Penobscot River Basin but none on the West Branch. In my opinion a seventeenth is needed, as noted above.

Stream flow gauges provide valuable information to the regulatory community, natural resource agencies, and to various user groups including anglers and boaters. In New York for example, USGS gauges at multiple locations in portions of the Delaware River system downstream of New York City Department of Environmental Protection water supply reservoirs provide real time flow, and in some instances water temperature data. Such data have been crucial in fine tuning reservoir releases during periods of thermal stress to protect cold water fisheries, plus advise prospective anglers, boaters and other recreational users of current conditions.

I am uncertain if anomalies in McKay Station flow data that were previously determined from electrical generation attributes have been fully resolved. Regardless, I strongly support actions to effect the installation of a gauge as described above, preferably in the near term.

Thank you for the opportunity to provide comments on this important matter.

Philip J. Hulbert
895 Brickhouse Hill Rd.
East Meredith, NY 13757

Brookfield
Renewable U.S.

February 2, 2024

***Via eFiling***

Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Fifth Study Progress Report**

Dear Secretary Reese:

Great Lakes Hydro America, LLC (GLHA), Licensee of the Ripogenus Hydroelectric Project (FERC No. 2572) and the Penobscot Mills Hydroelectric Project (FERC No. 2458) (collectively referred to as the "Projects"), herein files with the Federal Energy Regulatory Commission ("FERC" or "Commission") the Fourth Study Progress Report for the relicensing of the Projects. The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot counties, Maine.

The current licenses for the Projects were issued on October 22, 1996 and expire on September 30, 2026. On June 11, 2021, GLHA filed the Notices of Intent and Pre-Application Document, which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through the Commission's Integrated Licensing Process (ILP). On March 23, 2022, GLHA filed a Revised Study Plan (RSP) for the Projects, and the Commission issued the Study Plan Determination (SPD) on May 13, 2022. GLHA performed study activities in 2022 with available results provided in the Initial Study Report (ISR) filed with FERC on April 24, 2023. Subsequent to the filing of the ISR, stakeholders filed comments on the ISR and new study requests, and on September 19, 2023, FERC issued the second SPD. GLHA performed continued study activities in 2023 for which available results will be provided in the Updated Study Report (USR) to be filed with FERC by April 22, 2024.

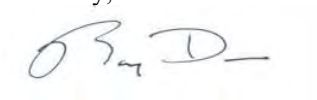
Pursuant to the RSP, GLHA herein submits the Fifth Study Progress Report for the period from November 1, 2023 through January 31, 2024 for the Projects. The enclosed table (report) provides a list of the required studies and associated status of progress, as well as any modifications to the approved methodologies.

Concurrent with this filing, GLHA is providing a copy of this letter to all parties listed in the attached distribution list. A copy of the Fifth Study Progress Report can be downloaded from FERC's eLibrary system at https://www.ferc.gov/docs-filing/elibrary.asp by conducting a search using the docket numbers p-2458 and/or p-2572.

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

If you have any questions regarding this information, please contact me at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman, Licensing Manager
Brookfield Renewable

cc: Relicensing Distribution List

Enclosure: Fifth Study Progress Report

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

**Federal Agencies**

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Shannon McCrory
Deputy District Manager
Northeastern States
Bureau of Land Management
250 E. Wisconsin Avenue
Milwaukee, WI 53202

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Debbie-Anne A. Reese
Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jay Clement
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

Leonard Rawlings
FERC Coordinator
Eastern Region
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Karen McGuire
New England Region 1
Deputy Regional Administrator
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

**State Agencies**

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Laura Paye
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Peter Jamieson
Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
40 Western Avenue
E.S. Muskie Federal Building, Room 412
Augusta, ME 04330

Stacey Guerin
State Senator
3 State House Station
Augusta, ME 04333

Kathy Irene Javner
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, Maine 04333

Trey Stewart
State Senator
3 State House Station
Augusta, ME 04333

James Lee White
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, ME 04333-0002

**Native American Tribes**

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Rena Newell
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

**Additional Parties**

Dr. Andrew Fisk
Northeast Regional Director
American Rivers

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Jesika Lucarelli
Great Mountain Guide Service

Mark Nadeau
International Association of Machinists
245 Pamola Park
Millinocket, ME 04462

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Director
Maine Professional River Outfitters
PO Box 669
Millinocket, ME 04462-0669

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing

Matt Polstein
New England Outdoor Center

Jeremy Hargreaves
Northeast Whitewater

Derek Heady
Northeast Whitewater

Suzie Hockmeyer
Co-founder
Northern Outdoors, Inc.
1771 US Rt 201
The Forks, ME 04985

Emily Yearwood
Northern Outdoors, Inc.
1771 US Rt 201
The Forks, ME 04985

Michael Smith
Outdoor Sport Institute
176 Highland Ave
Millinocket, ME 04462

Kenny DeCoster
Vice President
Penobscot Paddle and Chowder Society

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Allison Economy
Representative for Allagash Gateway
Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Thomas Nannery
Sportsman's Alliance of Maine
205 Church Hill Rd
Augusta, ME 04330-9801

Jimmy Doria
Three Rivers Whitewater

Neil Hagstrom
Trout Unlimited

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Brian Stranko
Maine Program Manager
Trout Unlimited

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,

Dean Beaupain

Jeff Fayle

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Christopher Howe

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Charles Paone

Richard Parkes

Edward Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Robert Van Deventer

Wes Zemrak
2 Brookside Drive
Falmouth, ME 04105

FIFTH STUDY PROGRESS REPORT

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>Fifth Study Progress Report<br>(November 1, 2023 through January 31, 2024) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 1a | Water Quality Study – Impoundment Lake Trophic Assessment | Study completed as required in 2022 with study results provided in the ISR. | None. |
| 1b | Water Quality Study – Downstream DO/Water Temperature Assessment | • First season study activities were completed as required in 2022 with study results provided in the ISR.<br>• Based on comments during the ISR Meeting and pursuant to FERC's SPD issued September 19, 2023, additional water temperature data was collected at three monitoring sites in the West Branch downstream of Stone Dam in June and July 2023.<br>• Data collected in 2023 will be provided in the USR. | None. |
| 1c | Water Quality – Benthic Macroinvertebrate Assessment | • First season study activities were completed as required in 2022 with study results provided in the ISR.<br>• Additional macroinvertebrate data was collected in 2023 at two locations in the West Branch downstream of Stone Dam.<br>• Data collected in 2023 will be provided in the USR. | None. |
| 1d | Water Quality – Impoundment Aquatic Habitat Assessment | Study completed as required in 2022 with study results provided in the ISR. | None. |
| 1e | Water Quality – Riverine Aquatic Habitat Assessment | Study completed as required in 2022 with study results provided in the ISR. | None. |
| 2 | Instream Flow and Habitat Assessment of West Branch below Stone Dam | Study completed as required in 2022 with study results provided in the ISR. | None. |

GREAT LAKES HYDRO AMERICA, LLC
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>Fifth Study Progress Report<br>(November 1, 2023 through January 31, 2024) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 3 | Fish Assemblage Survey Study | • First season study activities completed in 2022 with study results provided in the ISR.<br>• Pursuant to FERC's SPD issued September 19, 2023, GLHA will perform a fish assemblage survey at the Ripogenus Project in the spring of 2024 (likely late May or early June pending suitable field conditions).<br>• Data collected during the spring of 2024 will be provided in a USR supplement. | None. |
| 4 | Fish Stranding Study | • Study completed as required in 2022 with study results provided in the ISR.<br>• Additional information specific to the Fish Stranding Mitigation Study and the McKay Station Ramping Study is provided below. | None. |
| 5 | North Twin Impoundment Tributary Access Survey | Pursuant to the RSP and SPD:<br>• Based on the consultation with MDIFW, tributary surveys were performed in mid-July 2022, but the fall 2022 survey could not be performed due to wet weather and high impoundment elevations.<br>• The fall tributary survey was performed in early November 2023.<br>• Data collected in 2023 will be provided in the USR. | None. |

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>Fifth Study Progress Report<br>(November 1, 2023 through January 31, 2024) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 6 | Upstream American Eel Passage Assessment Study | • First season study activities were completed as required in 2022 with study results provided in the ISR.<br>• Based on comments received during the ISR Meeting and the FERC SPD issued on September 19, 2023, GLHA performed nighttime eel observations and electrofishing surveys at the Dolby, Millinocket, North Twin, and Millinocket Lake Storage Developments.<br>• From mid-July through September 2023, 5-7 nighttime eel observation events were conducted at each dam .<br>• In July/August 2023, one nighttime electrofishing survey was performed downstream of the Millinocket, North Twin, and Millinocket Lake Storage dams. Due to high water conditions throughout the late summer and fall, after consultation with USFWS, MDMR, PIN, and MDIFW, further attempts to conduct additional electrofishing surveys were suspended in October.<br>• Data collected in 2023 will be provided in the USR. | • Heavy precipitation coupled with planned unit outages for maintenance during the summer of 2023 resulted in high flows in the rivers and spill conditions at the dams limiting the ability to perform nighttime eel observations and electrofishing surveys. Although there were fewer surveys than anticipated, the monitoring completed in 2023 allowed GLHA to gain a good understanding of juvenile American eel presence and behavior at the Penobscot Mills Project. |
| 7 | Desktop Downstream Eel Passage Route and Survival Study | Study completed as required in 2022 with study results provided in the ISR. | None. |

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>Fifth Study Progress Report<br>(November 1, 2023 through January 31, 2024) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 8 | Recreation Study | • Portions of the study were completed in 2022 with study results provided in the ISR.<br>• GLHA completed the following study activities in 2023:<br>o Recreation site inventory and assessment of the Dolby Development and Green Bridge Boat Launch recreation sites.<br>o Spot and calibration counts of recreation users at the Dolby Development and Green Bridge Boat Launch recreation sites from May through September 2023.<br>o Redeployment of recreation user surveys kiosks at Project recreation sites at the Ripogenus and Penobscot Mills Projects, which will remain available through March 2024.<br>• GLHA consulted with interested stakeholders to form a recreation focus group. GLHA met with the focus group on January 22, 2024 to further assess and gain additional input on the existing Project recreation sites and several non-Project recreation access sites.<br>• Data collected in 2023 and early 2024, including input from the focus group meeting, will be provided in the USR. | None. |

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>Fifth Study Progress Report<br>(November 1, 2023 through January 31, 2024) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 9 | Whitewater Boating Assessment Study | • First season study activities were completed in 2022 with study results provided in the ISR.<br>• Per the September 19, 2023 SPD, GLHA is in the process of planning, in consultation with AW, AMC, and boating interests a Level 2 evaluation of the West Branch below Stone Dam.<br>• The Level 2 reconnaissance field study is planned to be conducted in spring/summer of 2024.<br>• Data collected in 2023 will be provided in the USR. Data collected in 2024 will be provided in a USR addendum. | None. |
| 10 | Aesthetic Study | • Portions of the study were completed in 2022 with study results provided in the ISR.<br>• GLHA consulted with interested stakeholders to form an aesthetics focus group. A conference call and site visit to the Project area was performed with the focus group in October 2023 to evaluate various Key Observation Points.<br>• Data collected in 2023 will be provided in the USR. | None. |
| 11 | Historic Architectural Survey | • Study completed as required in 2022 with study results provided in the ISR.<br>• GLHA is in the process of reviewing and addressing comments provided by the Maine Historic Preservation Commission and will provide updated information, as appropriate, in the USR. | None. |
| 12 | Historical Operations Data Assessment Study | • Study completed as required in 2022 with study results provided in the ISR. | None. |

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>Fifth Study Progress Report<br>(November 1, 2023 through January 31, 2024) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 13 | Operations Model Study | • First season study activities were completed in 2022 with study results provided in the ISR.<br>• GLHA hosted a 2-day, Operations Model Technical Workshop for stakeholders to participate in-person or virtually on January 31-February 1, 2024.<br>• GLHA will provide stakeholders with a 30-day period for which to submit alternative operating scenarios to be evaluated by the model.<br>• Information presented at the technical workshop, stakeholder comments, and the results of the model runs for the requested alternative operating scenarios will be provided in the USR or via a USR supplement if not available by April 22, 2024. | None. |
| 14 | Wood Turtle Habitat and Presence Evaluation Study | Consistent with the RSP and SPD:<br>• GLHA consulted with the MDIFW in early 2023.<br>• Based on the consultation with MDIFW, wood turtle habitat areas were identified and field surveyed in June 2023.<br>• No wood turtles were found during the field survey events performed in 2023.<br>• Data collected in 2023 will be provided in the USR. | None. |
| 15 | Marsh Bird Survey Study | Consistent with the RSP and SPD:<br>• GLHA consulted with the MDIFW in early 2023.<br>• Based on consultation with MDIFW, marsh bird habitat areas were identified and field surveyed between May 15 and June 30, 2023.<br>• Data collected in 2023 will be provided in the USR. | None. |

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>Fifth Study Progress Report<br>(November 1, 2023 through January 31, 2024) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 16 | Furbearer Survey Study | • During October 2023, GLHA consulted with MDIFW on proposed field study activities.<br>• From October 2-12, comprehensive furbearer surveys were performed throughout Ripogenus Impoundment and Umbazooksus Lake.<br>• Data collected in 2023 will be provided in the USR. | None. |
| 17 | Common Loon Management Plan Assessment Study | • The study was completed as required in 2022 with study results provided in the ISR. | None. |
| 18 | Riparian and Littoral Habitat Assessment Study | • First season study activities were completed in 2022 with study results provided in the ISR.<br>• Results from additional study activities as required by the September 19, 2023 SPD will be provided in the USR. | None. |
| 19 | Terrestrial, Botanical and Wildlife Resources Study | • The desk-top portion of the study was completed in 2022 with study results provided in the ISR.<br>• GLHA completed the study field activities in mid-August 2023.<br>• Data collected in 2023 will provided in the USR. | None. |
| 20 | Environmental Justice Study | Portions of the study were completed in 2022 with study results provided in the ISR.<br>• GLHA updated the study results per the September 19, 2023 FERC SPD.<br>• GLHA is in the process of performing additional consultation.<br>• Data collected in 2023 and early 2024 will be provided in the USR, as available. | None. |

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>Fifth Study Progress Report<br>(November 1, 2023 through January 31, 2024) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 21 | USGS Gage Feasibility Study | • GLHA will complete the study as required in consultation with the MDIFW and USGS with results anticipated to be provided in the USR. | None. |
| 22 | McKay Station Ramping Study | • In early September 2023, GLHA consulted with MDIFW to identify the window of time in which the study could be performed in consideration of the fish spawning season. MDIFW indicated the study should be performed after September 30 but prior to October 15, 2023. Due to the high precipitation events, in combination with the scheduled maintenance activities at McKay Station, which resulted in one or more turbine units were unavailable from early September through October 2023, GLHA was not able to perform the field activities during the designated time period. GLHA has notified the parties that requested the study of this schedule update.<br>• GLHA will consult with MDIFW to determine the timeframe to perform the study in 2024 and will consult with MDIFW and TU on the schedule and methods for the study field activities.<br>• Subsequent to completion of the required study activities, GLHA will file the results with FERC. | None. |
| 23 | Fish Stranding Mitigation Evaluation Study | • GLHA will complete the required fish stranding mitigation evaluation study subsequent to the completion of the McKay Station Ramping Study and will file the results with FERC when available. | None. |

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>Fifth Study Progress Report<br>(November 1, 2023 through January 31, 2024) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 24 | Umbazooksus Lake Mitigation Evaluation Study | • GLHA performed the field activities for this study in early October 2023.<br>• GLHA will consult with MDIFW on the results of the field survey completed and the evaluation of impacts to wetlands associated with higher water surface elevations.<br>• Data collected in 2023 will be provided in the USR. | None. |
| 25 | Angler Flow Evaluation in West Branch below Stone Dam | • During the fall of 2023, GLHA consulted with stakeholders and performed study field activities on October 24-25, 2023 to evaluate angler flows in the West Branch below Stone Dam.<br>• Data collected in 2023 will be provided in the USR. | None. |

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

Brookfield
Renewable U.S.

February 5, 2024

***Via eFiling***

Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Operations Model Technical Workshop Follow-up**

Dear Acting Secretary Reese:

Great Lakes Hydro America, LLC (GLHA), Licensee of the Ripogenus Hydroelectric Project (No. 2572) and the Penobscot Mills Hydroelectric Project (No. 2458) (collectively referred to as the "Projects"), herein provides follow-up information related to the Operations Model Study Technical Workshop that occurred on January 31 and February 1, 2024.

On January 31 and February 1, 2024, GLHA conducted an Operations Model Study Technical Workshop in Bangor, Maine. The workshop was attended by interested stakeholders either in-person or via MS Teams. A list of the workshop participants is enclosed.

During the workshop, GLHA presented detailed information supported by PowerPoint slides associated with the Operations Model that has been developed to support the relicensing of the Ripogenus and Penobscot Mills Projects. A copy of the PowerPoint slides presented during the workshop are enclosed.

At the close of the workshop, GLHA reviewed the process for stakeholders to request alternative operating scenarios to be evaluated by the Operations Model. To facilitate requests, GLHA has enclosed an Alternative Operating Scenario Request Form. GLHA requests that stakeholders interested in submitting alternative operating scenarios to be evaluated by the model do so by completing the enclosed form describing the requested alternative and justification for the request (the justification for the request is required for the scenario to be evaluated). **GLHA requests that stakeholders file the alternative operating scenario requests with FERC by March 6, 2024.**

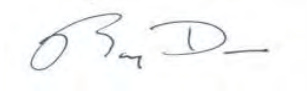
Subsequently, GLHA will file with FERC the model run results and schedule a virtual meeting with stakeholders to discuss the model run results. The schedule for the filing of the results and meeting with stakeholders to discuss the results will be dependent on the number and complexity of scenarios requested by stakeholders.

Concurrent with this filing, GLHA is providing a copy of this letter to all parties listed in the enclosed distribution list. Parties can download an electric copy of this filing from FERC's eLibrary system at https://www.ferc.gov/ferc-online/elibrary by conducting a search using the docket numbers P-2458 and/or P-2572.

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

If you have any questions regarding this information, please contact me by email at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman, Licensing Manager
Brookfield Renewable

cc: Relicensing Distribution List

Enclosures: Operations Model Workshop Participant List
Alternative Operating Scenario Request Form
PowerPoint Slides Presented during Operations Model Workshop

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

# Relicensing Distribution List

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

**Federal Agencies**

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Shannon McCrory
Deputy District Manager
Northeastern States
Bureau of Land Management
250 E. Wisconsin Avenue
Milwaukee, WI 53202

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Debbie-Anne A. Reese
Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

U.S. Army Corps of Engineers
Maine Project Office
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

Leonard Rawlings
FERC Coordinator
Eastern Region
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Karen McGuire
New England Region 1
Deputy Regional Administrator
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Kyle Olcott
Hydropower Coordinator
Maine Field Office
U.S. Fish and Wildlife Service
306 Hatchery Road
East Orland, ME 04431

Julianne Rosset
New England Field Office
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03300

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

**State Agencies**

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Laura Paye
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kathleen Leyden
Director
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Peter Jamieson
Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
40 Western Avenue
E.S. Muskie Federal Building, Room 412
Augusta, ME 04330

Stacey Guerin
State Senator
3 State House Station
Augusta, ME 04333

Kathy Irene Javner
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, Maine 04333

Trey Stewart
State Senator
3 State House Station
Augusta, ME 04333

James Lee White
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, ME 04333-0002

**Native American Tribes**

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Rena Newell
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

**Additional Parties**

Dr. Andrew Fisk
Northeast Regional Director
American Rivers

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Jesika Lucarelli
Great Mountain Guide Service

Mark Nadeau
International Association of Machinists
245 Pamola Park
Millinocket, ME 04462

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing

Matt Polstein
New England Outdoor Center

Jeremy Hargreaves
Northeast Whitewater

Derek Heady
Northeast Whitewater

Suzie Hockmeyer
Co-founder
Northern Outdoors, Inc.
1771 US Rt 201
The Forks, ME 04985

Emily Yearwood
Northern Outdoors, Inc.
1771 US Rt 201
The Forks, ME 04985

Michael Smith
Outdoor Sport Institute
176 Highland Ave
Millinocket, ME 04462

Kenny DeCoster
Vice President
Penobscot Paddle and Chowder Society

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Allison Economy
Representative for Allagash Gateway
Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Thomas Nannery
Sportsman's Alliance of Maine
205 Church Hill Rd
Augusta, ME 04330-9801

Jimmy Doria
Three Rivers Whitewater

Neil Hagstrom
Trout Unlimited

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Brian Stranko
Maine Program Manager
Trout Unlimited

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,

Dean Beaupain

Jeff Fayle

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Christopher Howe

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Charles Paone

Richard Parkes

Edward Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Robert Van Deventer

Wes Zemrak
2 Brookside Drive
Falmouth, ME 04105

Debbie-Anne Reese
Acting Secretary Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

February 9, 2024

Subject: Comments on Interim Plan for Aquatic Resource Protection during McKay Station Outages submitted by Great Lakes Hydro Associates to FERC (FERC No. P-2572-133)

Dear Acting Secretary Reese:

I am writing to comment on aspects of the interim measures proposed by Great Lakes Hydro Associates (GLHA) via a letter to FERC dated January 19, 2024. I recognize the significance of the term "interim." Overall, I saw little in GLHA's proposals that would solve the actual problem: how to avoid rapid flow reductions in the event of a unit outage. In earlier filings to FERC, GLHA contends that outages due to events such as lightning strikes are unforeseeable and beyond their control. While the latter point is wholly understandable, I consider it not credible to contend that unplanned outages are unforeseeable. Predicting when some acts of nature, damaging lightning strikes for example, will occur may well be impossible with present technology; however, recognizing that such events will occur is fundamental to operating many systems. For example numerous fish hatcheries and facilities such as hospitals have backup generators with transfer switches designed to quickly restore functions dependent upon line power. They are regularly tested (exercised) to help ensure functionality. I cannot say if this approach is beyond the realm of the doable for McKay Station, though I expect there are numerous experts who can. Determining the applicability of such a system to McKay Station may be a worthwhile interim measure given the re-licensing timetable.

I recognize that the Maine Department of Inland Fisheries and Wildlife (MEDIFW) recommended that GLHA "mitigate" for salmonid and macroinvertebrate mortalities through monetary penalties for low flow occurrences. One definition of mitigation I read, admittedly on the internet, states "reducing risk of loss from the occurrence of any undesirable event." I realize there are likely other definitions. A monetary fine or penalty sounds more like compensation to me than mitigation. Furthermore, there is no logical basis for GLHA proposing that no more than 5 "unplanned excursions" would be subject to mitigation (compensation). Would a 6$^{th}$ event in a year, however unlikely, not be harmful to the aquatic resources? I prefer to see measures implemented that would be capable of preventing rapid flow reductions that in FERC's words ".. have resulted in

adverse effects to aquatic life not anticipated at the time of licensing, as demonstrated by the numerous fish and macroinvertebrate strandings reported to us." (FERC letter to GLHA dated August 22, 2023).

Other measures mentioned by GLHA include transmission line maintenance and several technical upgrades to improve system reliability. Although continuation of an ongoing transmission line maintenance program is certainly reasonable it does not seem like it would move the needle much in terms of reducing the likelihood of an unplanned outage. If there are technical upgrades to existing McKay Station infrastructure that would improve system reliability, implementing those upgrades is prudent. I expect it would be in the best interests of GLHA to implement them under any circumstances.

In the filings pertinent to this issue I also noted several different possibilities for interim resource protection via continuous flow of varying amounts from Ripogenus Dam. Neither MEDIFW nor GLHA favor a large release, and I concur. Balancing water storage and flow through McKay Station among the various interests will be even more challenging if a large flow through Ripogenus Dam were to be implemented. Protection or enhancement of the existing aquatic community downstream from McKay Station is a worthy goal. Proponents seeking a substantial release from Ripogenus Dam need to remember that Atlantic Salmon and Brook Trout are cold water species that will not benefit from additional releases of warm surface waters.

Thank you for recognizing the importance of addressing outage impacts and for the opportunity to provide comments on this important matter.

Philip J. Hulbert
895 Brickhouse Hill Rd.
East Meredith, NY 13757

RIPOGENUS AND PENOBSCOT MILLS PROJECTS RELICENSING - Request for Operations Model Run

Datte of Request February 9, 2024
Name of Requestor: : Edward Spear
Affiliation of Requestor: None
Title of Scenario: Verify the Maine Department of Fisheries and Wildlife's (MeDIFW) requested flow in the Historic West Branch of the Penobscot River Channel Area

This request asks for verification of MeDIFW proposed West Branch Channel (Backchannel) flow of 500cfs (from Stone Dam)

This request focuses on providing river flows needed to sustain all landlocked salmon (salmon) life stages. This MeDIFW's proposal also provides fish and aquatic communities needs while providing seasonal fishing opportunity for adult salmon and possibly, stocked brook trout.

Present Project operations appear to have eliminated salmon production i.e., salmon spawning and incubation as well as parr production, in the tailwater reach below North Twin Dam. Watering of the backchannel (West Branch Channel) will produce recruits to the North Twin tailwaters as the tailwaters of Mill One. In effect the MeDIFW request serves as a Mitigation measure that replaces habitat lost to current Options.

Additional the proposed flow will create kayak, rafting, canoeing and other non fisheries recreation opportunities. These non fisheries and aquatic communities gain will combine and provide economic benefits to the local economy

request covers camp owners, boating, fisheries, aquatic communities and other recreationist stated needs. Additionally, this storage produces hydro-electric generation in an increasingly valuable wholesale market (see ISO NE)

2) The minimum operating flow i.e., when electricity is being generated, for this five-month period is 2400 cfs (including any Upper Gorge flow). The recommended flow waters the Holbrook bypass channel and fulfills the requirement of Article 406. This request also covers campers, boating, fisheries, aquatic communities, and other needs stated by recreationists. The recommended flow regime provides significant value to the local economy.

3) Yearlong Upper Gorge flow, provided by a deep gate or other cool water source is to be set at 200 cfs. This requests covers sightseeing, boating, fisheries, and aquatic communities and other stated needs.

While McKay Station flows can be increased, the system operator is responsible for maintaining impoundment elevations needed to meet the flow requirement of item two.

Following October 15th.

4) Maintain McKay station flow at a minimum of 2000 cfs until spring spill. This request provided protection to fish and aquatic communities.

5) From November 1st to Spring spill period the Licensee's only obligation is to ensure Ripogenus Impoundment storage is available to provide the requested West Branch "fall-winter" flow of 2000 cfs. This request provides protection during the salmon spawning and incubation period as well as all fish and aquatic communities.

Debbie-Anne Reese
Acting Secretary Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

February 14, 2024

Subject: Importance of Sport Fisheries Such As the West Branch Penobscot River (FERC No. P-2572-133)

Dear Acting Secretary Reese:

I am writing to emphasize the importance of sport fishing to the national economy, and more particularly to the economy of the State of Maine. This is relevant to the deliberations and decisions to be made in determining license conditions for the matter at hand. Those conditions will affect the quality of the sport fishery on the West Branch Penobscot River, particularly in reaches downstream from McKay Station to Abol Bridge, for many years.

Surveys of outdoor activities such as sport fishing are conducted by various agencies and organizations. Two purposes of these surveys are to estimate participation levels and the economic impact of sport fishing from geographical perspectives. The U.S. Fish and Wildlife Service periodically conducts a national survey. Based on their recent survey, in 2022, 39.9-million people age 16 and older fished a total of 785-million days in fresh and salt water combined, and approximately 71% of that angling activity reportedly occurred in the nation's fresh waters (U.S. Department of the Interior, 2023). Total expenditures for the 785-million days of fishing were estimated to be $99.4 billion; however, separation between fresh and salt water expenditures were not reported (same citation). In economic terms fishing is clearly a “big deal.”

Data specific to Maine are not available from the 2022 national survey. Data pertinent to the economic impact of sport fishing in Maine can, however, be found in a report prepared for the American Sportfishing Association (ASA) [lengthy citation to follow at the end of this letter]. That report estimated that fresh water fishing in Maine resulted in $233-million in retail sales, $111-million in salaries and wages, supported 3,151 jobs, and yielded $25.5-million in state and local tax revenue. It should also be noted that a federal excise tax on fishing related equipment purchased in Maine contributes to programs administered by the Maine Department of Inland Fisheries and Wildlife to enhance conservation activities. I am not familiar with studies or reports that document participation levels and economic impacts for the boating industry in Maine, but clearly whitewater rafting, canoeing and kayaking generate qualitatively similar benefits.

Why does this information matter? It matters because fishing and boating are enjoyed by many people, resident and non-residents of Maine alike, who spend significant amounts of money in these pursuits. It matters because the license conditions that will prevail on the West Branch Penobscot River below McKay Station for 30 years or so will profoundly influence the quality of fishery supported by that totally renewable aquatic resource. Many years ago an organization named the Sport Fishing Institute regularly published a bulletin. Immediately below the organization's name on each issue was the phrase “The Quality of Sport Fishing Reflects the Quality of Life.” Given the opportunity, why would one not use this re-licensing process to provide the best possible conditions for the West Branch Penobscot River sport fishery to flourish?

Thank you for the opportunity to comment on this matter.

Philip J. Hulbert
895 Brickhouse Hill Road
East Meredith, NY 13757

## Literature Cited

Sportfishing in America: A Reliable Economic Force. Produced for American Sportfishing Association by Southwick Associates via Multistate Grant #F20AP00183 awarded by the Wildlife and Sportfish Restoration Programs of the U.S. Fish and Wildlife Service. 2020.

U. S. Department of the Interior, U.S. Fish and Wildlife Service. 2022 National Survey of Fishing, Hunting and Wildlife-Associated Recreation. September 2023. Washington, D.C.

Debbie-Anne Reese
Acting Secretary Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

February 22, 2024

Subject: Erroneous Flow Data for the West Branch Penobscot River (FERC No. P-2572-133)

Dear Acting Secretary Reese:

I am writing to call attention to what I believe are significant errors in hourly flow data for the Ripogenus Project provided by Great Lakes Hydro Associates (GLHA). I examined some of the data, specifically "Ripogenus_HourlyOpsData_2000-2022 xls" contained in the Interim Study Report filed by GLHA on May 22, 2023 primarily to detect abrupt flow changes at McKay Station. On October 5, 2022 the short term flow reduction for the stranding study clearly appears in the data. Beginning on October 28, 2022 however, reported flows declined from 1,741 cfs (1300 hours) to 332 cfs (1400 hours) to 0 cfs (1500 hours) from both McKay Station and Ripogenus Dam. Zero flow is reported for all of the next four consecutive days and flow does not resume until 1000 hours on November 2, 2022. I infer that this information is incorrect as zero flow in the West Branch Penobscot River for that amount of time would be both ecologically catastrophic and a headline-grabbing event. I did not note recognition or clarification of this specific anomalous data in subsequent filings, though it is possible I missed that.

I respectfully request that FERC seek some explanation from GLHA as to what occurred, why it occurred, and, if possible, reassurance that target flows were actually achieved. Late October-early November are critical times for Atlantic Salmon as spawning generally commences within that time frame. I believe that the information presented in this letter reinforces the need for independent flow monitoring capability at a suitable location downstream from McKay Station. I leave it to FERC and GLHA to consider whether or not to determine if other hourly flow data for Ripogenus (ie. from other years) and the other locations included in the May 22, 2023 Interim Study Report filing are correct.

I look forward to your findings and thank you for the opportunity to comment on this matter.

Philip J. Hulbert
895 Brickhouse Hill Road
East Meredith, NY 13757

Debbie-Anne Reese
Acting Secretary Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

March 4, 2024

Subject: Puzzling Flow Data for the West Branch Penobscot River (FERC No. P-2572-133)

Dear Acting Secretary Reese:

I am writing to seek clarification pertinent to the following: flow data provided by Great Lakes Hydro Associates (GLHA); notifications when deviations from required minimum flows are implemented; and FERC's role in such circumstances. I will address each of these items separately although they are at least somewhat intertwined.

1. Previously I pointed out anomalous flow data reportedly occurring between October 28 and November 2, 2022. During this interval flows from McKay Station and Ripogenus Dam were predominately recorded as "zero" in the Ripogenus Hourly Ops Data for 2000-2022 provided by GLHA. These data are puzzling. Ripogenus Dam flows/releases of 100 or more cfs appeared both before and after this time interval as did non-zero flows from McKay Station. This situation does not comport with a statement from GLHA: "Additionally, in early 2020, GLHA implemented updates to the program that calculates station outflows, which removed sources of variability in the previous program and improved the overall consistency and accuracy of the calculated station outflows" (GLHA letter to ME Council of Trout Unlimited filed December 12, 2023). How does one know or determine what flows actually occurred? Were there in fact violations of the minimum flow requirement (at least 1,300 cfs) for that critical time of year (salmon spawning), and the amount of time required (3 days) to restore required flow? Did the Holbrook channel have required flow?

2. I do not fully understand the notification process regarding flows that depart from license conditions, and implementation of this process. For example, GLHA did not provide timely notification to FERC of flow deviations commencing in October 2021, which was clearly noted by FERC (FERC letter to GLHA filed August 22, 2023), although required consultation with various State of Maine agencies regarding this deviation did occur. GLHA did however, provide timely notice of an approximately 2-hour deviation from whitewater recreation flow requirements occurring on July 8, 2023 (GLHA letter to FERC filed July 21, 2023). The event I write about encompassed portions of 6 days. If there are flow data other than that specific to October 28-

November 2, 2022 that I am referencing, are stakeholders entitled to see them or be aware of their existence via notification? Is FERC aware of other flow information? Transparency of non-confidential information, ie. flow records, is a reasonable stakeholder and public expectation.

3. Based on reading most filings for this project from 2022 to the present time I see that FERC has followed up on some observations and concerns brought forward by stakeholders. To my knowledge no other individual or organization has filed a comment regarding what did/did not happen commencing on October 28, 2022. Perhaps my doing so does not meet the threshold for notification or some kind of follow-up. If so, I wonder what is the threshold?

Thank you for the opportunity to comment on this matter.

Philip J. Hulbert
895 Brickhouse Hill Road
East Meredith, NY 13757

March 4, 2024

Debbie-Anne A. Reese
Acting Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Electronically Filed**

**RE: Ripogenus Project (FERC P-2572) and Penobscot Mills Project (P-2458)**
**Request for Operations Model Run**

Dear Secretary Reese:

I am writing as a waterfront property owner/stakeholder within the above referenced re-licensing project area. My seasonal camp is on Caribou Lake within the Ripogenus Project area (FERC P-2572).

First, I would like to thank the Licensee (GLHA) and their consultant (HDR) for preparing and conducting the two-day Operations Model Technical Workshop on January 31st and February 1st in Bangor. I was able to attend in person and learned a great deal through all the presentations and open discussion. As a camp owner, the primary benefit for me was to be able to focus on the project operations data for 8 hours a day for two straight days.

Based on the workshop discussions, and my review of the baseline scenario simulation results, I am proposing one Scenario run with input data modifications to the "Target Elevation" schedule (see attached Ops Model Run form). The proposed modifications are based on actual historical elevation data for Ripogenus and N. Twin (predominantly using pre-2014 data). The proposed modifications represent more stable water levels with reduced drawdowns (in comparison to the current operating conditions).

My knowledge of the project areas dates to the late 1970's when I first canoed and fished the West Branch Penobscot River. I have returned regularly over the decades and have owned a camp on Caribou Lake since 2015. I have direct observational experience, over a lengthy time, of the project area.

As a professional geologist, I have over 40 years of professional environmental consulting experience throughout New England. My expertise in hazardous waste and hydrogeological consulting includes site assessment, subsurface investigations, delineation of groundwater capture zones and flow nets for recovery well systems, use of analytical and numerical computer models to simulate groundwater flow and contaminant transport; and design, operation and maintenance of soil and groundwater remediation systems. Since the 1980's I have developed and utilized numerical groundwater flow models and analytical groundwater models for simulating pumping

well zones of contribution and solute transport. This modeling often includes simulation of surface water impacts.

So, based on education, technical modeling experience, knowledge of the project area, and my understanding of the CHEOPS model gained at the workshop as a stakeholder, I feel qualified to evaluate the Baseline Scenario and request modifications to the scenario.

Thank you for considering these comments.

Respectfully submitted,

Michael J. Hudson
618 S. Clary Road
Jefferson, Maine 04348

Email: mjhudson655@gmail.com
508-733-0855

Attachment: Request for Operations Model Run

March 5, 2024

Ms. Debbie- Anne Reese
Acting Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Via online submission to: http://www/ferc.gov**

Subject: **NGO Requests for Ops Model Runs for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458)**

Dear Secretary Bose:

American Whitewater, the Appalachian Mountain Club, Caribou and Chesuncook Lake Camp Association, Chesuncook Village Association, the Chesuncook Dam Camp Association, and Maine Council of Trout Unlimited ("NGOs" or "signatories") submit these requests for Ops Model runs in response to the Great Lakes Hydro America, LLC ("Brookfield") letter dated February 5, 2024, Subject: Ripogenus Hydroelectric Project (FERC No. 2572-133) Penobscot Mills Hydroelectric Project (FERC No. 2458-247) Operations Model Technical Workshop Follow-up.

These requests taken together represent major user groups and stakeholders of the river and lakes, including fishermen and women on both the lakes and rivers, whitewater boaters, hikers, canoeists, campers at public campsites, and camp owners. We ask that special consideration be given to these requests. We ask that they be run individually and those results reported to us. Once that has been accomplished, we ask that a combination of the scenarios be run and those results be reported to us as well.

We ask that leeway be given in determining the viability of the modifications from the baseline scenario. While the CHEOPS Ops Model as presented may be the best available tool for evaluating operational scenarios for the projects, many assumptions were made to generate the model, e.g., flashboard installation, proration of Seboeis flows, rules on how the project is operated, correlation between generation data and actual flows, etc. Variability was not quantified but some variability must be expected.

The signatories appreciate the opportunity to submit these requests for Ops Model runs and trust that they will be run as requested.

Respectfully submitted,

American Whitewater
Bob Nasdor
Northeast Stewardship & Legal Director

Appalachian Mountain Club
Mark Zakutansky
Director of Conservation Policy Engagement

Maine Council of Trout Unlimited
Stephen G. Heinz
Maine TU Council FERC Coordinator

Caribou and Chesuncook Lake Camp Association, Chesuncook Village Association, and the Chesuncook Dam Camp Association
Bill Houston
Spokesperson

ATTACHMENTS:

TU Requests

American Whitewater/Appalachian Mountain Club Requests

Caribou and Chesuncook Lake Camp Association, Chesuncook Village Association, and the Chesuncook Dam Camp Association Requests

| | |
|---|---|
| **Date of Request:** | March 4, 2024 |
| **Name of Requestor:** | Michael J. Hudson |
| **Affiliation of Requestor:** | Camp Owner/Stakeholder, Caribou Lake |
| **Title of Scenario:** | Scenario 1 |

**Required: Describe the scenario request (i.e., modification to the Baseline Scenario) and the resource(s) of interest and the anticipated benefit to the resource(s) as a result of this requested scenario. Identify metrics for evaluating success/ benefit of this scenario and the specific questions you think this scenario will answer.**

The attached 2-page table is a scenario that requests one set of specific changes to the "Target Elevation" schedules for Ripogenus and N. Twin. The selected target elevations for Scenario 1 are based on observed historical data and pre-2014 trends (i.e. they are "feasible").

The table lists the resources of interest, anticipated benefits, and questions the scenario answers.

Please perform this scenario with no other modifications to the Baseline Scenario, to allow a direct comparison to the Baseline Scenario results.

Each scenario run will be compared with the "Baseline Scenario". "Baseline" project operating conditions follow the operating requirements of the existing FERC license as described below.

All elevations are expressed in National Geodetic Vertical Datum of 1929 (NGVD 29) unless otherwise specified.

| Prepared by M. J. Hudson | **Scenario 1 Request**<br>**(Full Lake May 15th, 1 foot drawdown monthly June 1st to October 15th)** |  |
|---|---|---|
| **Requested modification to the baseline scenario** | **Resources of interest and anticipated benefits** | **Success/ Benefit metrics** |
| *CURRENT:*<br><br>*No drawdown limits on Ripogenus Lake, Chesuncook Lake and Caribou Lake*<br><br>**PROPOSED:**<br><br>**Winter drawdown based on evaluation of snowpack, timing of spring thaw and forecasted precipitation to a full lake refill of 941.6 feet as conditions permit.**<br><br>**Winter drawdown will not exceed 16.5 feet or target elevation 925.1 on April 1 unless GLHA makes notification of a "wet year" condition on or after Feb. 15th.**<br><br>**A lake elevation of 940.1, (within 1.5 feet of normal full pond elevation) maintained until May 15th.** | Resource of Interest:<br>● Ripogenus Lake<br>● Caribou Lake<br>● Chesuncook Lake<br><br>Anticipated Benefit:<br>● Lakes are refilled every spring allowing for maximum storage in the recreational season<br><br>Feasibility:<br>● April 1st elevations at or above 925.1 occurred in 2000, 2006, 2007, 2009, 2010, 2011, 2012, 2021, 2022<br><br>● May 15th elevations at or above 940.1 occurred in 2000, 2005, 2007, 2008, 2010, 2011, 2017, 2018, 2019, and 2022 (includes wet, dry, and average years per Operations Data from 2000 to 2022)<br><br>● 1.5 feet below full pond allows for management of spring freshet | ● Are the lakes reaching a full pond elevation of 941.6 feet and being maintained to at least 940.1 feet through May 15th?<br><br>● Is enough water maintained in the winter to fill the lakes in the spring?<br><br>● Are the lakes being refilled every spring?<br><br>● Do the lake elevations drop 1 foot per month from June 1st to October 15th? |
| **After June 1st, lake drawdown will not exceed 1 foot per month per the following "Target Elevation" schedule:**<br><br>**May 15 940.1**<br>**June 1 940.1**<br>**July 1 939.1**<br>**Aug. 1 938.1**<br>**Sept. 1 937.1**<br>**Oct. 1 936.1**<br>**Oct. 15 935.6** | Resources of interest:<br>● Loons - see Loon Study recommendations<br>● Access to Ripogenus Lake, Caribou Lake and Chesuncook Lake<br>● Bureau of Public Lands Campsites<br><br>Anticipated Benefits:<br>● Healthy loon populations thrive on the lakes<br>● Keeps boat launches usable during peak fishing season<br>● Provides sufficient water to maintain relatively stable lake levels throughout the recreational season. | ● Is loon habitat being protected?<br><br>● Are boat launches and public campsites usable and accessible throughout the recreation season? |

| | | |
|---|---|---|
| **After October 15th the lakes will be gradually lowered to a winter drawdown level no lower than elevation 925.1 (16.5 feet of drawdown) unless a "wet year" condition exists per GLHA notification** | • Mirrors stable lake levels as cited in the 1993 license application, **"Since 1972, … the average drawdown [during the summer recreational season (Memorial Day to Labor Day)] has been 3.5 feet."**<br><br>• Both boat launches are usable the entire recreational season. According to the Recreation Study, Caribou boat launch is usable above 936.7 and the Chesuncook Dam boat launch is usable above 931.9.<br><br>Feasibility:<br>• October 15th elevations at or above 935.6 occurred in 2006, 2008, 2009, and 2011.<br><br>• In 2014 the East Millinocket Mill permanently closed and the Millinocket Mill smokestacks were demolished. This ushered in a new era for the region, and for the energy produced - energy generated is sold to ISO. | • Is the lake elevation above 935.6 on October15th?<br><br>• Is safe navigation possible between the lakes?<br><br>• Is this State of Maine Statue being met:<br>Maine revised statute 38 636 pg. 3 Will the project result in significant benefit or harm to the public rights of access to and use of the surface waters of the State for navigation, fishing, fowling, recreation and other lawful public uses; [1983, c. 458, §18 (NEW).] |
| **North Twin Impoundment Model Inputs**<br><br>**Winter target elevation on April 1 should be set at 479.42 (12 feet drawdown).**<br><br>**Use this "Target Elevation" schedule:**<br><br>**Jan. 1 482.0**<br>**Feb. 1 480.0**<br>**April 1 479.4**<br>**May 1 488.7**<br>**May 10 490.4**<br>**June 1 490.4**<br>**July 1 490.4**<br>**Aug. 1 489.9**<br>**Sept. 1 489.0**<br>**Oct. 1 488.6**<br>**Nov. 1 486.0**<br>**Dec. 1 484.0** | Resource of Interest:<br>• North Twin Lake<br>• South Twin Lake<br>• Pemadumcook Lake<br>• Ambajejus Lake<br>• Elbow Lake<br><br>Anticipated Benefits<br><br>• Meets current license Article 408 which states in part that water level: "…*shall be maintained at a relatively stable level from May 1 through August 22 annually, and at a minimum target level of 488.42 feet USGS (3.5-foot drawdown) for the period August 22 through October 15."*<br><br>Feasibility:<br><br>• The lakes have operated close to this scenario since 1996 | • Does the target elevation schedule achieve the lake elevations stipulated in the current license? |

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JANET T. MILLS
GOVERNOR

MELANIE LOYZIM
COMMISSIONER

March 5, 2024

Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

RE: Alternative Operating Scenario Requests for Ripogenus (FERC No. 2572) and Penobscot Mills Projects (FERC No. 2458)

Dear Acting Secretary Reese:

Brookfield Renewable Inc. requested alternative operating scenario requests for the Ripogenus and Penobscot Mills Hydroelectric Projects be filed with FERC. The Maine Department of Environmental Protection requests the following alternative operating scenarios be modelled:

- Discharge from McKay Station
  - Model Steady Target flows (24/7) at 500, 600, 800, 1,000, 1,200, and 1,400 cfs
    - If the number of requests is infeasible, the Department requests the following be the minimum discharges modelled from McKay Station: 500, 1,000, and 1,400 cfs
  - See November 15, 2023 Department comments on the "Draft Interim Plan for Aquatic Resource Protection during McKay Station Outages"
  - Requested scenarios are to address water quality concerns from the Stranding Study in the ISR, which will be a topic in the Water Quality Certification process with the Department
- Below Stone Dam into the West Branch
  - Model steady target flows (24/7) at 3, 50, 100, 170, 200, 300, 500, 1,000, and 2,000 cfs discharged from Stone Dam into the West Branch.
    - If the number of requests is infeasible, the Department requests the following be the minimum discharges modelled from Stone Dam: 50, 200, 500, 1,000, and 2,000 cfs
    - Leakage (minimum flow under current license) often provides 100 cfs, which is only 53-60% of the wetted width below Stone Dam
  - See ISR Table 5.3-3.6 Total wetted area and percentage wetted area in the West Branch below Stone Dam (Class B water)
  - Requested scenarios are to address minimum flows that will be required by the Water Quality Certification

**AUGUSTA**
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
(207) 287-7688 FAX: (207) 287-7826

**BANGOR**
106 HOGAN ROAD, SUITE 6
BANGOR, MAINE 04401
207-941-4570 FAX: (207) 941-4584

**PORTLAND**
312 CANCO ROAD
PORTLAND, MAINE 04103
(207) 822-6300 FAX: (207) 822-6303

**PRESQUE ISLE**
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04769
(207) 764-0477 FAX: (207) 760-3143

WEBSITE: www.maine.gov/dep

Additionally, the Department requests any photographs or diagrams showing stream conditions in the Upper Gorge and below Stone dam. The 1989 Upper Gorge Flow Study included black and white photocopies of sites in the Upper Gorge under leakage and 50 cfs, and copies of those in color or any photos like it, such as below Stone Dam, would be appreciated.

The Department consulted with the Maine Department of Inland Fish & Wildlife and the U.S. Fish and Wildlife Service and supports their flow requests in addition to those listed above.

If you have any questions about this matter, please contact me at laura.paye@maine.gov or 207-219-9563.

Sincerely,



Laura Paye
Hydropower Coordinator
Maine Department of Environmental Protection

| | |
|---|---|
| **Date of Request:** | March 5, 2024 |
| **Name of Requestor:** | Laura Paye |
| **Affiliation of Requestor:** | Hydropower Coordinator, Maine Department of Environmental Protection |
| **Title of Scenario:** | Range of Flows Below McKay Station |

**Required: Describe the scenario request (i.e., modification to the Baseline Scenario) and the resource(s) of interest and the anticipated benefit to the resource(s) as a result of this requested scenario. Identify metrics for evaluating success/ benefit of this scenario and the specific questions you think this scenario will answer.**

-Model Steady Target flows (24/7) at 500, 600, 800, 1,000, 1,200, and 1,400 cfs

- If the number of requests is infeasible, the Department requests the following be the minimum discharges modelled from McKay Station: 500, 1,000, and 1,400 cfs

-See November 15, 2023 Department comments on the "Draft Interim Plan for Aquatic Resource Protection during McKay Station Outages"

-Requested scenarios are to address water quality concerns from the Stranding Study in the ISR, which will be a topic in the Water Quality Certification process with the Department

Each scenario run will be compared with the "Baseline Scenario". "Baseline" project operating conditions follow the operating requirements of the existing FERC license as described below.

All elevations are expressed in National Geodetic Vertical Datum of 1929 (NGVD 29) unless otherwise specified.

| | |
|---|---|
| **Date of Request:** | March 5, 2024 |
| **Name of Requestor:** | Laura Paye |
| **Affiliation of Requestor:** | Hydropower Coordinator, Maine Department of Environmental Protection |
| **Title of Scenario:** | Range of Flows Below Stone Dam |

**Required: Describe the scenario request (i.e., modification to the Baseline Scenario) and the resource(s) of interest and the anticipated benefit to the resource(s) as a result of this requested scenario. Identify metrics for evaluating success/ benefit of this scenario and the specific questions you think this scenario will answer.**

Below Stone Dam into the West Branch:

-Model steady target flows (24/7) at 3, 50, 100, 170, 200, 300, 500, 1,000, and 2,000 cfs discharged from Stone Dam into the West Branch.

- if the number of requests is infeasible, the Department requests the following be the minimum discharges modelled from Stone Dam: 50, 200, 500, 1,000, and 2,000 cfs

-Leakage (minimum flow under current license) often provides 100 cfs, which is only 53-60% of the wetted width below Stone Dam

-See ISR Table 5.3-3.6 Total wetted area and percentage wetted area in the West Branch below Stone Dam (Class B water)

-Requested scenarios are to address minimum flows that will be required by the Water Quality Certification

Each scenario run will be compared with the "Baseline Scenario". "Baseline" project operating conditions follow the operating requirements of the existing FERC license as described below.

All elevations are expressed in National Geodetic Vertical Datum of 1929 (NGVD 29) unless otherwise specified.

JANET T. MILLS
GOVERNOR

STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
353 WATER STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041

JUDITH CAMUSO
COMMISSIONER

March 6, 2024

Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**RE: Alternative Operating Scenario Requests for Ripogenus (FERC No. 2572) and Penobscot Mills Projects (FERC No. 2458)**

Dear Acting Secretary Reese:

Great Lakes Hydro America, LLC (GLHA), a subsidiary of Brookfield Renewable, has requested alternative operating scenario requests for the Ripogenus and Penobscot Mills Hydroelectric Projects be filed with FERC. The Maine Department of Inland Fisheries and Wildlife requests the following alternative operating scenarios be modelled:

1. **Ripogenus Impoundment Elevations**

   Target Elevation: May 31: 940 ft.

   Minimum elevation: July 1: 937 ft. (2-foot drawdown)

   Minimum elevation: Sept 30: 935 ft. (4-foot drawdown)

2. **MacKay Station Outflows Scenarios:**

   A. Model steady target flows (24/7) flows at 1800 cfs, 2000 cfs, 2200 cfs, and 2400 cfs from May 31 to September 30 while maintaining lake elevation goals.
   B. Model steady target flows as above with the option to reduce flows from 9:00 PM - 6:00 AM to 1,000 cfs (current minimum flow), 1,200 cfs, 1,400 cfs, and 1,600 cfs using ramping rate of no more than 25% change per hour while maintaining lake elevation goals.

3. **West Branch Penobscot River below Stone Dam**

   A. Model steady target flows (24/7) at 200 cfs, 300 cfs, 500 cfs, and 700 cfs, and calculated Aquatic Base Flow, discharged from Stone Dam into the West Branch.

PHONE: (207) 287-5254 FISH AND WILDLIFE ON THE WEB: www.maine.gov/ifw EMAIL ADDRESS: IFWEnvironmentalreview@maine.gov

We appreciate the Licensee's ongoing commitment to work through these issues. Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,



John Perry
Environmental Review Coordinator

Cc: Tim Obrey, Jeff Bagley—MDIFW Fisheries Division, Region E
Kevin Dunham, Kevin Gallant—MDIFW Fisheries Division, Region F
Doug Kane, Scott McLellan—MDIFW Wildlife Division, Region E
Mark Caron, Lauren McPherson—MDIFW Wildlife Division, Region F
Laura Paye, MDEP
Casey Clark, MDMR
Kyle Olcott, USFWS

**Maine Professional Rafting Outfitters**

March 6, 2024

Debbie-Anne A. Reese
Acting Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Re**: Ripogenus Project (P-2572) and Penobscot Mills Project (P-2458)
Comments on Request for Operations Model Run

Dear Secretary Reese:

Maine Professional Rafting Outfitters (MEPRO) is an organization of the commercial rafting outfitters that operate on the Penobscot River below McKay Station. Its members are impacted by the commitments to the industry made in connection with this licensing process. Maine's whitewater rafting industry plays a vital role in bolstering the State's rural economy by attracting tourists and providing employment opportunities in remote areas. We appreciate the opportunity to provide comments on the Operations Model Run.

Under the existing FERC license, commercial rafters and the whitewater rafting industry have historically had recreation flows from May 1 - September 15 between the hours of 8:30am-5:00pm. MEPRO seeks to ensure that this arrangement is preserved and that a minor logistical adjustment is made to fully satisfy that arrangement. Under the existing license, the agreed-upon flows are set forth below:

| ***Whitewater*** | |
|---|---|
| May 1 – September 15<br>(8:30 AM – 5:00 PM) | Normal hydrologic year[3]:<br>• 2,300 cfs on Saturdays and Sundays<br>• 2,200 cfs on Mondays and Fridays<br>• 2,000 cfs on Tuesdays through Thursdays<br>Wet or dry hydrologic year[3]:<br>• 2,200 cfs on Saturdays and Sundays<br>• 2,000 cfs on Mondays and Fridays<br>• 1,800 cfs on Tuesdays through Thursdays |
| September 16 – October 1<br>(8:30 AM– 5:00 PM) | Normal hydrologic year[3]:<br>• 2,300 cfs on Saturdays and Sundays<br>Wet or dry hydrologic year[3]:<br>• 2,200 cfs on Saturdays and Sundays |
| June 8 – October 14<br>(5:00 PM – 8:30 AM) | 1,000 cfs |

It is critical to the whitewater rafting industry that the license requires maintaining these flows and ensuring their predictability during recreation hours. The simple act of preserving our existing arrangement will provide significant benefits to support outdoor recreation and tourism, which, with the decline of other industry, has become the number one industry in the area and is increasingly important to Maine's rural economy.

**Scenario request**

In order to ensure that recreational flows are available during the agreed upon hours, our request is as follows:

1. **If flows are dropped below agreed-upon flows during the overnight hours, we request earlier releases that will enable recreation flow to reach all commercial access points (McKay and Nesowadnehunk) by 8:30am.**

Recreation flows are guaranteed from 8:30am-5:00pm, with a minimum of 1800 cfs being released during a wet/dry year on certain days of the week. We have experienced that, in a dry year when the turbines may be dropped to just 1 operating turbine overnight, an earlier release is needed to ensure that the recreation flow reaches McKay and Nesowadnehunk by 8:30am.

The minimum flow required to run a safe and enjoyable whitewater rafting trip are the flows that are currently in the license– including a minimum of 1800 cfs on a wet/dry year, and 2000 cfs on a normal year. This request is intended identify and confirm an earlier release from McKay when flows are dropped below 2000 cfs overnight, to ensure sufficient recreational flows make it to Nesowadnehunk Falls by 9:00am for our members who put in there, and to ensure river operations can continue to operate as usual and consistent flows are maintained throughout the 14 mile section we raft during recreation hours.

To illustrate, some of our members put their rafts in at 8:30am at McKay station for a full river trip, which could mean taking out as late as 5:00pm at Never's Corner. Other members put their trips in at Nesowadnehunk Falls at 9:00am for a lower river trip. Different trips offer different experiences, with some outfitters offering lower river only trips to accommodate the folks looking for a less adventurous trip. Under the current permitting regime, when flows have dropped below 2000 cfs overnight, outfitters have experienced low water at Nesowadnehunk Falls during the identified recreation hours of 8:30am to 5:00pm (most specifically at 9:00am when they are putting in their rafts). This inhibits their ability to begin full river trips on time.

Therefore, we are using this process to communicate with FERC and the license holder that we would like the arrangement to remain the same as has been true under the current permit. However, in order to honor that arrangement, additional time is required to increase the low flow

up to the recreation flow by the start of designated recreation hours, due to slow fill in Nesowadnehunk Dead Water and Abol Dead Water.

This request helps us to identify the time needed to ensure there is adequate flow during recreation hours. Our goal is to protect the water levels the whitewater industry relies on for continued success, while also recognizing the importance and value of other interests and endeavors. We favor a water management system that supports a stable operating environment.

Commitment to an earlier release time under low flow scenarios will allow the whitewater industry and customers to have confidence that recreation flows will reach launch points at a time and in a manner that enables predictable launch times, and a consistent flow throughout the river for running rapids. We would consider this scenario a success if the outcome is that the whitewater industry has adequate flow for running the river at 8:30am, whether putting in at McKay Station or Nesowadnehunk.

# United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE

Ecological Services
Maine Field Office
P.O. Box A
306 Hatchery Road
East Orland, Maine 04431
207/469-7300 Fax: 207/902-1588

March 6, 2024

Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Re: Ripogenus Hydroelectric Project, FERC No. 2752**
**Penobscot Mills Hydroelectric Project, FERC No. 2458**
**Alternative Operating Scenario Requests**

Dear Acting Secretary Reese:

As part of the Operations Model Study for the relicensing of the Ripogenus and Penobscot Mills Hydroelectric Projects (Project Nos. 2752 and 2458), Great Lakes Hydro America has requested that interested parties submit alternative operating scenario requests to FERC by March 6, 2024.

The U.S. Fish and Wildlife Service, Maine Field Office, provides its alternative operating scenario requests in the attached documents. Should you have any questions about these requests, please contact Kyle Olcott by telephone at 207-902-1573 or via email at dudley_olcott@fws.gov.

Sincerely,

AMANDA CROSS Digitally signed by AMANDA CROSS
Date: 2024.03.05 14:45:48 -05'00'

Amanda S. Cross, Ph.D.
Project Leader
Maine Field Office

cc: FERC, Secretary (e-filed)
Brookfield Renewable, Mike Scarzello (via email)
HDR, Cate Russell (via email)
MDEP, Laura Paye (via email)
MDIFW, John Perry, Tim Obrey (via email)
Penobscot Nation, Dan McCaw (via email)
MDMR, Casey Clark (via email)
NOAA, Don Dow, Jeff Murphy (via email)

Attachments: Alternative Operating Scenario Request Forms

ES: DOlcott:3-06-24: (207) 902-1573

| | |
|---|---|
| **Date of Request:** | March 6, 2024 |
| **Name of Requestor:** | Kyle Olcott |
| **Affiliation of Requestor:** | Hydropower Coordinator, US FWS Maine Field Office |
| **Title of Scenario:** | Range of Flows Below Ripogenus Dam and McKay Station |

**Required: Describe the scenario request (i.e., modification to the Baseline Scenario) and the resource(s) of interest and the anticipated benefit to the resource(s) as a result of this requested scenario. Identify metrics for evaluating success/ benefit of this scenario, and the specific question(s) you would like this scenario will answer.**

Request 1 - Model Steady Target flows below Rip Dam into Upper Gorge (24/7) at 200, 300, 400, 500, 600, 800, 1,000, 1,200, and 1,400 cfs

- If the number of requests is infeasible, FWS requests the following be the minimum discharges modeled from Rip Dam into the Upper Gorge: 200, 500, 1,000, and 1,400 cfs

-See November 15, 2023 MDEP comments on the "Draft Interim Plan for Aquatic Resource Protection during McKay Station Outages" which the FWS supported

-Requested scenarios are to address water quality concerns from the Stranding Study in the ISR

-Any minimum flows into the Upper Gorge could potentially be provided via a minimum flow turbine at the deep gates at Rip Dam.

Request 2 - Chesuncook impoundment elevation

- target elevation of 940 feet by May 31st
- minimum elevation of 937 feet on July 1st
- minimum elevation of 935 feet on September 30th

Request 3 - model steady target flows into West Branch via McKay station (24/7) at 1800, 2000, 2200, and 2400 cfs from May 31 to Sept 30 while maintaining Chesuncook impoundment elevation goals

-model steady target flows via McKay station as above with the option to reduce flows from 9pm to 6am to 1000 (current minimum flow), 1200, 1400, 1600 cfs using ramping rate of no more than 25% change per hour while maintaining Chesuncook impoundment elevation goals

Each scenario run will be compared with the "Baseline Scenario". "Baseline" project operating conditions follow the operating requirements of the existing FERC license as described below.

All elevations are expressed in National Geodetic Vertical Datum of 1929 (NGVD 29) unless otherwise specified.

| | |
|---|---|
| **Date of Request:** | March 6, 2024 |
| **Name of Requestor:** | Kyle Olcott |
| **Affiliation of Requestor:** | Hydropower Coordinator, US FWS Maine Field Office |
| **Title of Scenario:** | Range of Flows Below Stone Dam |

**Required: Describe the scenario request (i.e., modification to the Baseline Scenario) and the resource(s) of interest and the anticipated benefit to the resource(s) as a result of this requested scenario. Identify metrics for evaluating success/ benefit of this scenario and the specific questions you think this scenario will answer.**

Below Stone Dam into the West Branch:

-Model steady target flows (24/7) at 3, 50, 100, 170, 200, 300, 500, 1,000, and 2,000 cfs discharged from Stone Dam into the West Branch.

- If the number of requests is infeasible, FWS requests the following minimum discharges are modeled below Stone Dam: 50, 200, 500, 1,000, and 2,000 cfs

-Requested scenarios are to assess the feasibility of potential minimum flows below Stone Dam that would protect and/or enhance aquatic habitat.

Each scenario run will be compared with the "Baseline Scenario". "Baseline" project operating conditions follow the operating requirements of the existing FERC license as described below.

All elevations are expressed in National Geodetic Vertical Datum of 1929 (NGVD 29) unless otherwise specified.

March 13, 2024

Debbie-Anne A. Reese
Acting Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Name of Requestor: Ben Worrell – Rudman Winchell
Affiliation of Requestor: William R. Cushing
Title of Scenario: Increase Ripogenus Operating Level and Introduce Minimum Elevation Requirement

Dear Acting Secretary Reese:

This request focuses on maintaining a minimum elevation for the Ripogenus Impoundment and increasing the Impoundment's operational level to 944 feet, and introduce a minimum elevation during peak recreation season.

**HISTORICAL RECORD FOR INCREASED ELEVATION LEVEL**

The Ripogenus Impoundment dates back to 1916 with the construction of the Ripogenus Dam. The Pre-Application Document, filed on June 11, 2021, states that in 1923 the Ripogenus Dam was heavily modified, which resulted in the normal full pond elevation of the Ripogenus impoundment to increase in elevation of four feet to a total of 941.59 feet, and that the Ripogenus has remained unchanged since 1923. However, this is not an accurate depiction of the impoundment's historical elevation levels. In 1917 an easement was granted from the Weber family to the West Branch Driving and Reservoir Dam Company, a subsidiary of Great Northern Paper Company,

> …to keep and maintain a head of water on Chesunook Dam and the Ripogenus Concrete Dam… and other bodies of water affected, or to be effected by such head and flowage that shall flow the same land of the above name grantors in the East half of Township three (3), Range twelve (12) in said Piscataquis County up to contour line nine hundred and forty (940), and no further, and the right to flow and cover with water at any and all times so much of said land as will be flowed or covered with water by keeping and maintain said head of water on said dam, or either of them, up to said contour line of nine hundred forty (940)…

Said easement was recorded with the Piscataquis County Registry of Deeds and is attached as *Exhibit A*. Furthermore, the easement was modified in 1924,

> …to keep and maintain a head of water on the Ripogenus Concrete Dam in the County of Piscataquis and State of Maine, and on Chesuncook Lake, Ripogenus Lake, and other bodies of water affected, or to be affected by such head and flowage that shall flow the

> same land of the above name grantors in the East one-half of Township three (3), Range twelve (12), W.E.L.S, (4) four feet beyond and above contour line nine hundred and forty (940) and no further, and the right to flow and cover with water at any and all times so much of said land as will be flowed or covered with water by keeping and maintain said head of water on said dam up to a point four (4) feet beyond and above said contour line 940 and no farther.

Said easement was recorded with the Piscataquis Registry of Deeds and is attached as *Exhibit B*. Accordingly, the 1924 amended easement set the full pond elevation of the Chesuncook Lake and Ripogenus Impoundment at 944 feet.

The rights held under the above easements have been transferred several times over the years. Starting in 1952, a contract between West Branch Driving and Reservoir Dam Company and Great Northern Paper Company was recorded with the Piscataquis County Registry of Deeds. Said contract granted Great Northern Paper the right to operate the Ripogenus Dam and to draw water out of ponds raised by said Dam in Township three (3), Range eleven (11). Said contract failed to incorporate the terms from the 1924 easement related to the water on the other side of the Ripogenus Dam. Great Northern Paper held the rights to the project areas until 1970 when it merged with the Nekoosa-Edwards Paper Company to form Great Northern Nekoosa Corporation. During the 1970's and 1980's Great Northern Paper deeded various areas of land and use rights to different companies and individuals as FERC was established and as Great Northern Nekoosa changed their operations. Specifically, on December 16, 1988, Great Northern Nekoosa signed a Quitclaim Deed with Covenant to several individuals, which covered several areas related to the Ripogenus Project including areas in Township three (3), Range twelve (12), which were subject to 1924 amended flowage easement and is attached as *Exhibit C*. Said deed conveys,

> Excepting that portion of land laying between the normal high water mark of Chesuncook Lake as flooded by Ripogenus Dam under FERC Project No. 2572 (spillway crest of 941.59 feet U.S.G.S. vertical datum) and the elevation line of 943.00 feet U.S.G.S. vertical datum, as shown on a map by Great Northern Paper, titled Survey Plan, Sheet 1 of 2, dated March 1986… Further excepting certain flowage rights granted to West Driving and Reservoir Dam Company by instruments dated July 28 and 31, 1908…

However, the reference deeds cited in the 1988 quitclaim deed does not include the 1924 amended flowage easement for waters conveyed. Thus, the true high water mark of the Ripogenus Impoundment of 944 was not accurately represented in the 1988 deed.

This trend continued through the 1990's and early 2000's as Great Northern Nekoosa under a corporate takeover, started winding down operations, and transferred its remaining interests in the corresponding project areas. Accordingly, it was during this time that Great Lakes Hydro America and Brookfield Renewable became interest holders in project areas. As this occurred, several deeds were recorded to secure GLHA/Brookfield's interests in the project areas, all of which failed to memorialize the true elevation of the Chesuncook Lake and Ripogenus Impoundment. However, in 2022, GLHA/Brookfield received a mortgage from the

Bank of New York Mellon Trust Co. via a secured transaction which was recorded in Piscataquis County Registry of Deeds, Book 2829, Page 95 and is attached as *Exhibit D*. The Ripogenus Project and other FERC projects are subject to said mortgage as collateral. Section 2.24 of said mortgage references a 1999 deed from Great Northern Paper to Great Northwoods LLC with a flowage easement for land upstream of the Ripogenus Dam to not exceed an elevation of **943.6** feet.

Accordingly, there is a historical precedent that the Ripogenus operated at a higher maximum operating level then is represented in the Operations Model. Furthermore, GLHA/Brookfield has recognized this historical precedent as evidenced by their 2022 mortgage with the Bank of New York Mellon Trust Co.

**SCENARIO REQUEST #1**

| **Request Modification To Baseline Scenario** | **Resource Of Interest And Anticipated Benefit To The Resource As A Result Of This Requested Scenario** | **METRICS FOR EVALUATING SUCCESS/BENEFIT OF THIS SCENARIO AND THE SPECIFIC QUESTION THE SCENARIO ADDRESSES** |
|---|---|---|
| Introduce drawdown limit and minimum elevation level of 941 feet for Chesuncook Lake, Caribou Lake, and Ripogenus Impoundment.<br><br>Full pond elevation shall be set at 944 feet.<br><br>Winter drawdown shall be based on annual evaluation of snowpack, timing of spring thaw and forecasted precipitation, with a maximum draw down of 28 – 30 feet until May 1, to ensure full lake refill of 944 feet. | Resources of Interest:<br>• Ripogenus Impoundment<br>• Chesuncook Lake<br>• Caribou Lake<br><br>Anticipated Benefit:<br>1. Lakes are refilled every spring for maximum storage in the recreational season.<br>2. Minimum elevation level of 941 feet will allow better management of spring freshet. | 1. Are the resources reaching full elevation of 944 feet and maintaining an elevation of 941 feet until May 1?<br><br>2. Will a drawdown limit help maintain resource elevation levels in recreational season?<br><br>3. What are Generation numbers from May 1 through October 23? |
| From May 1 until June 1 maintain elevation levels of resources between 943 feet and 942 feet.<br><br>From June 1 until June 15 maintain elevation levels of resources between 942 feet and 941 feet.<br><br>From June 15 until June 20 maintain elevation levels of resources between 943 feet and 942 feet. | Resources of Interest:<br>• Loons<br>• Ripogenus Lake<br>• Caribou Lake<br>• Chesuncook Lake<br><br>Anticipated Benefits:<br>1. Healthy loon populations thrive.<br>2. Keeps boat launches usable during peak fishing season. | 1. Are loon habitats being protected?<br><br>2. Are elevation levels stable to maintain use of public launches, campsites, and other public recreational uses throughout the season?<br><br>3. Will downstream resources be maintained? |

| | | |
|---|---|---|
| From June 20 until July 4 maintain elevation levels of resources at 944 feet.<br><br>From July 4 until July 15 maintain elevation levels of resources between 944 feet and 941 feet.<br><br>From July 15 until July 20 maintain elevation levels of resources between 944 feet and 941.10 feet. | 3. Provides sufficient water to maintain stable lake levels throughout the recreational season. | 4. What are generation numbers with these elevation levels? |
| From July 20 until September 25 maintain elevation levels of resources between 944 feet and 941.10 feet.<br><br>From September 25 until October 5 maintain elevation levels of resources between 944 feet and 943 feet.<br><br>From October 5 until October 23 maintain elevation levels of resources between 944 feet and 942 feet.<br><br>From October 23 until Winter maintain elevation levels of resources between 944 feet and 943 feet. | Resources of Interest:<br>• Ripogenus Lake<br>• Caribou Lake<br>• Chesuncook Lake<br>• Access to lakes<br>• Bureau of Public Lands Campsites<br><br>Anticipated Benefits:<br>1. Mirrors 2023 recreational season elevation levels.<br>2. Recreational uses of Resources are fully utilized.<br>3. Multiple boat launches remain operational. | 1. Are elevation levels stable to maintain use of public launches, campsites, and other public recreational uses throughout the season?<br><br>2. Will downstream resources be maintained?<br><br>3. What are generation numbers with these elevation levels? |
| North Twin Impoundment Elevation Model Inputs:<br>• January 1 – 482<br>• February 1 – 480<br>• April 1 – 479.4<br>• May 1 – 488.7<br>• May 10 – 490.4<br>• June 1 – 490.4<br>• July 1 – 490.4<br>• August 1 – 489.9<br>• September 1 – 489<br>• October 1 – 488.6<br>• November 1 – 486<br>• December 1 – 484 | Resources of Interest:<br>• North Twin Lake<br>• South Twin Lake<br>• Pemadumcook Lake<br>• Ambajejus Lake<br>• Elbow Lake | 1. Are elevation levels maintained pursuant to the current license requirements? |

**SCENARIO REQUEST #2**

| Request Modification To Baseline Scenario | Resource Of Interest And Anticipated Benefit To The Resource As A Result Of This Requested Scenario | METRICS FOR EVALUATING SUCCESS/BENEFIT OF THIS SCENARIO AND THE SPECIFIC QUESTION THE SCENARIO ADDRESSES |
|---|---|---|
| Introduce drawdown limit and minimum elevation level of 941 feet for Chesuncook Lake, Caribou Lake, and Ripogenus Impoundment.<br><br>Full pond elevation shall be set at 944 feet.<br><br>Reduce active turbines from 3 to 1.<br><br>Winter drawdown shall be based on annual evaluation of snowpack, timing of spring thaw and forecasted precipitation, with a maximum drawdown of 28 – 30 feet until May 1, to ensure full lake refill of 944 feet. | Resources of Interest:<br>• Ripogenus Impoundment<br>• Chesuncook Lake<br>• Caribou Lake<br><br>Anticipated Benefit:<br>1. Lakes are refilled every spring for maximum storage in the recreational season.<br>2. Minimum elevation level of 941 feet will allow better management of spring freshet. | 1. Are the resources reaching full elevation of 944 feet and maintaining an elevation of 941 feet until May 1?<br><br>2. Will a drawdown limit help maintain resource elevation levels in recreational season?<br><br>3. What are Generation numbers from May 1 through October 23? |
| From May 1 until June 1 maintain elevation levels of resources between 943 feet and 942 feet.<br><br>From June 1 until June 15 maintain elevation levels of resources between 942 feet and 941 feet.<br><br>From June 15 until June 20 maintain elevation levels of resources between 943 feet and 942 feet.<br><br>From June 20 until July 4 maintain elevation levels of resources at 944 feet.<br><br>From July 4 until July 15 maintain elevation levels of resources between 944 feet and 941 feet. | Resources of Interest:<br>• Loons<br>• Ripogenus Lake<br>• Caribou Lake<br>• Chesuncook Lake<br><br>Anticipated Benefits:<br>1. Healthy loon populations thrive.<br>2. Keeps boat launches usable during peak fishing season.<br>3. Provides sufficient water to maintain stable lake levels throughout the recreational season. | 1. Are loon habitats being protected?<br><br>2. Are elevation levels stable to maintain use of public launches, campsites, and other public recreational uses throughout the season?<br><br>3. Will downstream resources be maintained?<br><br>4. What are generation numbers with these elevation levels? |

| | | |
|---|---|---|
| From July 15 until July 20 maintain elevation levels of resources between 944 feet and 941.10 feet. | | |
| From July 20 until September 25 maintain elevation levels of resources between 944 feet and 941.10 feet.<br><br>From September 25 until October 5 maintain elevation levels of resources between 944 feet and 943 feet.<br><br>From October 5 until October 23 maintain elevation levels of resources between 944 feet and 942 feet.<br><br>From October 23 until Winter maintain elevation levels of resources between 944 feet and 943 feet. | Resources of Interest:<br>• Ripogenus Lake<br>• Caribou Lake<br>• Chesuncook Lake<br>• Access to lakes<br>• Bureau of Public Lands Campsites<br><br>Anticipated Benefits:<br>1. Mirrors 2023 recreational season elevation levels.<br>2. Recreational uses of Resources are fully utilized.<br>3. Multiple boat launches remain operational. | 1. Are elevation levels stable to maintain use of public launches, campsites, and other public recreational uses throughout the season?<br><br>2. Will downstream resources be maintained?<br><br>3. What are generation numbers with these elevation levels? |
| North Twin Impoundment Elevation Model Inputs:<br>• January 1 – 482<br>• February 1 – 480<br>• April 1 – 479.4<br>• May 1 – 488.7<br>• May 10 – 490.4<br>• June 1 – 490.4<br>• July 1 – 490.4<br>• August 1 – 489.9<br>• September 1 – 489<br>• October 1 – 488.6<br>• November 1 – 486<br>• December 1 – 484 | Resources of Interest:<br>• North Twin Lake<br>• South Twin Lake<br>• Pemadumcook Lake<br>• Ambajejus Lake<br>• Elbow Lake | 1. Are elevation levels maintained pursuant to the current license requirements? |

**SCENARIO REQUEST #3**

| Request Modification To Baseline Scenario | Resource Of Interest And Anticipated Benefit To The Resource As A Result Of This Requested Scenario | METRICS FOR EVALUATING SUCCESS/BENEFIT OF THIS SCENARIO AND THE SPECIFIC QUESTION THE SCENARIO ADDRESSES |
|---|---|---|
| Introduce drawdown limit and minimum elevation level of 941 feet for Chesuncook Lake, Caribou Lake, and Ripogenus Impoundment. Full pond elevation shall be set at 944 feet.<br><br>A minimum flow of 3,000 cfs from North Twin from August 22 through October 15 while maintaining a minimum elevation for North Twin of 488.42 feet and following the elevation schedule below for the Ripogenus.<br><br>Winter drawdown shall be based on annual evaluation of snowpack, timing of spring thaw and forecasted precipitation, with a maximum drawdown of 28 – 30 feet until May, to ensure full lake refill of 944 feet. | Resources of Interest:<br>• Ripogenus Impoundment<br>• Chesuncook Lake<br>• Caribou Lake<br>• North Twin Lake<br>• South Twin Lake<br>• Pemadumcook Lake<br>• Ambajejus Lake<br><br>Anticipated Benefit:<br>1. Maintaining stable lake elevations for both North Twin and Ripogenus.<br>2. Reflects operating possibilities since the closing of mills making use of project resources. | 1. Impacts on fishing, boating, camping and other recreational activities?<br><br>2. Impacts on recreational safety?<br><br>3. Impacts on wildlife?<br><br>4. Are the requested elevation levels maintained with flowage request? |
| From May 1 until June 1 maintain elevation levels of resources between 943 feet and 942 feet.<br><br>From June 1 until June 15 maintain elevation levels of resources between 942 feet and 941 feet.<br><br>From June 15 until June 20 maintain elevation levels of resources between 943 feet and 942 feet.<br><br>From June 20 until July 4 maintain elevation levels of resources at 944 feet.<br><br>From July 4 until July 15 maintain elevation levels of | Resources of Interest:<br>• Loons<br>• Ripogenus Lake<br>• Caribou Lake<br>• Chesuncook Lake<br><br>Anticipated Benefits:<br>1. Healthy loon populations thrive.<br>2. Keeps boat launches usable during peak fishing season.<br>3. Provides sufficient water to maintain stable lake levels throughout the recreational season. | 1. Are loon habitats being protected?<br><br>2. Are elevation levels stable to maintain use of public launches, campsites, and other public recreational uses throughout the season?<br><br>3. Will downstream resources be maintained?<br><br>4. What are generation numbers with these elevation levels? |

| | | |
|---|---|---|
| resources between 944 feet and 941 feet.<br><br>From July 15 until July 20 maintain elevation levels of resources between 944 feet and 941.10 feet. | | |
| From July 20 until September 25 maintain elevation levels of resources between 944 feet and 941.10 feet.<br><br>From September 25 until October 5 maintain elevation levels of resources between 944 feet and 943 feet.<br><br>From October 5 until October 23 maintain elevation levels of resources between 944 feet and 942 feet.<br><br>From October 23 until Winter maintain elevation levels of resources between 944 feet and 943 feet. | Resources of Interest:<br>• Ripogenus Lake<br>• Caribou Lake<br>• Chesuncook Lake<br>• Access to lakes<br>• Bureau of Public Lands Campsites<br><br>Anticipated Benefits:<br>1. Mirrors 2023 recreational season elevation levels.<br>2. Recreational uses of Resources are fully utilized.<br>3. Multiple boat launches remain operational. | 1. Are elevation levels stable to maintain use of public launches, campsites, and other public recreational uses throughout the season?<br><br>2. Will downstream resources be maintained?<br><br>3. What are generation numbers with these elevation levels? |
| North Twin Impoundment Elevation Model Inputs:<br>• January 1 – 482<br>• February 1 – 480<br>• April 1 – 479.4<br>• May 1 – 488.7<br>• May 10 – 490.4<br>• June 1 – 490.4<br>• July 1 – 490.4<br>• August 1 – 489.9<br>• September 1 – 489<br>• October 1 – 488.6<br>• November 1 – 486<br>• December 1 – 484 | Resources of Interest:<br>• North Twin Lake<br>• South Twin Lake<br>• Pemadumcook Lake<br>• Ambajejus Lake<br>• Elbow Lake | 1. Are elevation levels maintained pursuant to the current license requirements? |

**SCENARIO REQUEST #4**

| Request Modification To Baseline Scenario | Resource Of Interest And Anticipated Benefit To The Resource As A Result Of This Requested Scenario | METRICS FOR EVALUATING SUCCESS/BENEFIT OF THIS SCENARIO AND THE SPECIFIC QUESTION THE SCENARIO ADDRESSES |
|---|---|---|
| Full pond elevation shall be set at 944 feet.<br><br>Winter drawdown shall be based on annual evaluation of snowpack, timing of spring thaw and forecasted precipitation, with a maximum drawdown of 32 – 36 feet until May 1, to ensure full lake refill of 944 feet. | Resources of Interest:<br>• Ripogenus Impoundment<br>• Chesuncook Lake<br>• Caribou Lake<br><br>Anticipated Benefit:<br>1. Lakes are refilled every spring for maximum storage in the recreational season.<br>2. Minimum elevation level of 941 feet will allow better management of spring freshet. | 1. Are the resources reaching full elevation of 944 feet and maintaining an elevation of 941 feet until May 1?<br><br>2. Will a drawdown limit help maintain resource elevation levels in recreational season?<br><br>3. What are Generation numbers from May 1 through October 23? |
| From May 1 until June 1 maintain elevation levels of resources between 943 feet and 935 feet.<br><br>From June 1 until June 15 maintain elevation levels of resources between 943 feet and 932 feet.<br><br>From June 15 until June 20 maintain elevation levels of resources between 935 feet and 930 feet.<br><br>From June 20 until July 4 maintain elevation levels of resources at 934 feet.<br><br>From July 4 until July 15 maintain elevation levels of resources between 935 feet and 929.5 feet.<br><br>From July 15 until July 20 maintain elevation levels of resources between 932 feet and 927.5 feet. | Resources of Interest:<br>• Loons<br>• Ripogenus Lake<br>• Caribou Lake<br>• Chesuncook Lake<br><br>Anticipated Benefits:<br>1. Healthy loon populations thrive.<br>2. Keeps boat launches usable during peak fishing season.<br>3. Provides sufficient water to maintain stable lake levels throughout the recreational season. | 1. Are loon habitats being protected?<br><br>2. Are elevation levels stable to maintain use of public launches, campsites, and other public recreational uses throughout the season?<br><br>3. Will downstream resources be maintained?<br><br>4. What are generation numbers with these elevation levels? |

| | | |
|---|---|---|
| From July 20 until September 25 maintain elevation levels of resources between 932 feet and 924.5 feet.<br><br>From September 25 until October 5 maintain elevation levels of resources between 944 feet and 943 feet.<br><br>From October 5 until October 23 maintain elevation levels of resources between 925 feet and 920 feet.<br><br>From October 23 until Winter maintain elevation levels of resources between 944 feet and 920 feet. | Resources of Interest:<br>• Ripogenus Lake<br>• Caribou Lake<br>• Chesuncook Lake<br>• Access to lakes<br>• Bureau of Public Lands Campsites<br><br>Anticipated Benefits:<br>1. Mirrors 2023 recreational season elevation levels.<br>2. Recreational uses of Resources are fully utilized.<br>3. Multiple boat launches remain operational. | 1. Are elevation levels stable to maintain use of public launches, campsites, and other public recreational uses throughout the season?<br><br>2. Will downstream resources be maintained?<br><br>3. What are generation numbers with these elevation levels? |
| North Twin Impoundment Elevation Model Inputs:<br>• January 1 – 482<br>• February 1 – 480<br>• April 1 – 479.4<br>• May 1 – 488.7<br>• May 10 – 490.4<br>• June 1 – 490.4<br>• July 1 – 490.4<br>• August 1 – 489.9<br>• September 1 – 489<br>• October 1 – 488.6<br>• November 1 – 486<br>• December 1 – 484 | Resources of Interest:<br>• North Twin Lake<br>• South Twin Lake<br>• Pemadumcook Lake<br>• Ambajejus Lake<br>• Elbow Lake | 1. Are elevation levels maintained pursuant to the current license requirements? |

# EXHIBIT A

Water Level For Dif. Lakes.
"940" "944"

22) CHARLES P. WEBBER
FRANKLIN R. WEBBER
MINNIE P. HEALD, Trustees
of the Estate of John P.
Webber, late deceased, as to
one-half in common and undivided
CHARLES P. WEBBER, as to three-
sixteenths
FRANKLIN R. WEBBER, as to three-
sixteenths

TO

WEST BRANCH DRIVING AND
RESERVOIR DAM COMPANY

Dated: November 1, 1917
Ackn'd: November 15, 1917
Rec'd: November 27, 1917

EASEMENT

$1.00 etc.

. . . the receipt whereof is hereby acknowledged, do hereby as to our interests as aforesaid, give, grant, remise, release, sell and forever quit-claim unto the said West Branch Driving and Reservoir Dam Company, its successors and assigns forever, the right to keep and maintain a head of water on Chesuncook Dam and the Ripogenus Concrete Dam, both in the County of Piscataquis, in said State of Maine, and Chesuncook Lake, Ripogenus Lake and other bodies of water affected, or to be effected by such head and flowage that shall flow the same land of the above named grantors in the East half of Township three (3), Range twelve (12) in said Piscataquis County up to contour line nine hundred and forty (940), and no farther, and the right to flow and cover with water at any and all times so much of said land as will be flowed or covered with water by keeping and maintaining said head of water on said dam, or either of them, up to said contour line of nine hundredd forty (940), and no farther and the survey on which said contour is based refers to the same datum, bench marks, etc. established by the Flowage Commission in 1908, which datum and bench marks are recorded

in Piscataquis Registry of Deeds in Plan Book No. 2, Page 10.

TO HAVE AND TO HOLD the aforegranted easement to said West Branch Driving and Reservoir Dam Company, its successors and assigns forever.

IN WITNESS WHEREOF, We, The said Grantors, have hereunto set our hands and seals this first day of November, in the year of our Lord one thousand nine hundred and seventeen.

Charles P Webber
Franklin R Webber
Minnie P. Heald
Trustees of the Estate of
John P. Webber

Charles P Webber
Franklin R Webber

Volume 193, Page 138

EXHIBIT B

24) CHARLES P. WEBBER
FRANKLIN R. WEBBER
RALPH B. WEBBER
MINNIE P. HEALD
JUNE W. McGEE

TO

WEST BRANCH DRIVING AND RESERVOIR DAM COMPANY

EASEMENT

$1.00 etc.

Dated: September 26, 1924
Acknd: November 25, 1924
Rec'd: January 6, 1925

. . . the receipt whereof is hereby acknowledged do hereby remise, release, sell and forever quit-claim unto the said West branch Driving and Reservoir Dam Company, its successors and assigns forever the right to keep and maintain a head of water on Ripogenus Concrete Dam in the County of Piscataquis and State of Maine, and on Chesuncook Lake Ripogenus Lake and other bodies of water affected or to be affected by such head and flowage that shall flow the land of the above named grantors in the East one-half of Township Three (3), Range Twelve (12), W.E.L.S , to a height of four (4) feet beyond and above contour line 940 and no farther, and the right to flow and cover with water at any and all times so much of said land as will be flowed or covered with water by keeping and maintaining said head of water on said dam up to a point four (4) feet beyond and above said contour line 940 and no farther.

The survey and datum on which said contour line is based refers to the same datum, bench marks, etc., established by the Flowage Commission in 1908, which datum and bench marks are recorded in Piscataquis Registry of Deeds in Plan Book 2, Page 10, and all the same are made a part hereof.

The Grantors' interests in said Township Three (3), Range Twelve (12), is all of the east one-half except a thirty (30) acre lot at the old Chesuncook Dam site and the rights to flow up to said

contour line 940 have been obtained by a deed from Charles P. Webber et als., dated November 1, 1917, and recorded in Piscataquis Registry of Deeds, Vol. 193, Page 138, and a deed from Ralph B. Webber, dated January 9, 1918, and recorded in Piscataquis Registry of Deeds, Vol. 191, Page 232.

TO HAVE AND TO HOLD the aforegranted easement to the said West Branch Driving and Reservoir Dam Company, its successors and assigns forever.

IN WITNESS WHEREOF, We, the said Charles P. Webber, Franklin R. Webber, Ralph B. Webber, Minnie P. Heald and June W. McGee have hereunto set our hands and seals this 26th day of September in the year of our Lord one thousand nine hundred and twenty-four.

Charles P Webber
Franklin R Webber
Minnie P. Heald
June Webber McGee.
Ralph B. Webber

Volume 218, Page 452

EXHIBIT C

BK0708PG174

QUITCLAIM DEED WITH COVENANT

07285

"ME REAL ESTATE TRANSFER TAX PAID"

Great Northern Nekoosa Corporation, formerly known as Great Northern Paper Company, a Maine corporation having a place of business in Millinocket, County of Penobscot and State of Maine, for consideration paid, grants to the following named Grantees, as tenants in common, with Quitclaim Covenant, in and to the in common and undivided interest stated for each respective tract or parcel of land: Barbara A. Cassidy, of Bangor, County of Penobscot, State of Maine, a one-fifth (1/5) in common and undivided interest in and to the respective fractional interests herein stated for each of the following described tracts or parcels of land; John Cassidy III, of Hampden, County of Penobscot, State of Maine, a one-fifth (1/5) in common and undivided interest in and to the respective fractional interests herein stated for each of the following described tracts or parcels of land; Roselle C. Flynn, of Kennebunkport, County of York, State of Maine, a one-fifth (1/5) in common and undivided interest in and to the respective fractional interests herein stated for each of the following described tracts or parcels of land;Fleet Bank of Maine, a Maine banking corporation, with a place of business at Bangor, County of Penobscot, State of Maine, and David M. Carlisle, of Bangor, in said County and State, Personal Representatives under the Will of Jane M. Sullivan, an eighteen-one hundred and twenty fifths (18/125) in common and

undivided interest in and to the respective fractional interests herein stated for each of the following described tracts or parcels of land;Fleet Bank of Maine, a Maine banking corporation, with a place of business at Bangor, County of Penobscot, State of Maine, and David M. Carlisle, of Bangor, in said County and State, Trustees under Indenture with Jane M. Sullivan dated December 20, 1978, a seven-one hundred and twenty fifths (7/125) in common and undivided interest in and to the respective fractional interests herein stated for each of the following described tracts or parcels of land;Fleet Bank of Maine, a Maine banking corporation with a place of business at Bangor, County of Penobscot, State of Maine, and Ralph I. Lancaster, Jr. of Portland, County of Cumberland, State of Maine, Trustees of the Marital Trust established under Article THIRD of the Will of Joan Cassidy Stetson, a seven-fiftieths (7/50) in common and undivided interest in and to the respective fractional interests herein stated for each of the following described tracts or parcels of land;Fleet bank of Maine, a Maine banking corporation with a place of business at Bangor, County of Penobscot, State of Maine, and Ralph I. Lancaster, Jr. of Portland, County of Cumberland, State of Maine, Trustees of the Residuary Trust established under Article FIFTH of the Will of Joan Cassidy Stetson, a three-fiftieths (3/50) in common and undivided interest in and to the respective fractional interests herein stated for each of the following described tracts or parcels of land, together with certain easements and rights of way, all as more particularly described in Schedule A attached hereto.

The following exceptions pertain to all parcels above described.

EXCEPTING AND RESERVING to the Grantor, its successors and assigns, from the above described premises the right to cross and recross on all the roads as they now exist or may in the future be reconstructed or relocated on the above-described premises for all lawful purposes including but not limited to access to other lands owned by the Grantor, whether contiguous or non-contiguous.

ALSO EXCEPTING AND RESERVING from the above described premises all real estate or rights therein, if any, conveyed of record by the Grantor herein or its predecessors in interest and all real estate or rights therein, if any, acquired through the exercise of the power of eminent domain by the United States of America, the State of Maine or any political subdivision thereof which may be a record but not specifically referred to herein.

ALSO EXCEPTING AND RESERVING from the above described premises all rights and title of the public and the State of Maine in and to all great ponds and the property underlying said great ponds falling in whole or in part within the property herein conveyed. Hereby conveying, however, as appurtenant to the above described premises, any right, title or interest that the Grantor may ever be determined to hold in or to said great ponds, or the property underlying said great ponds.

The above described premises are conveyed subject to the in common and undivided fractional interests set forth above under any and all leases, mineral and exploration permits, easements, harvesting or extraction permits affecting the above described premises, whether recorded or unrecorded. For the same consideration paid, Grantor hereby also assigns, sells, transfers and sets over to the above named Grantees, their respective heirs, personal representatives, successors and assigns, forever, the in common and undivided fractional interests set forth above under said leases and permits in and to the above described premises and the right to collect moneys due by reason of any wood, lumber, gravel or minerals cut or taken from any of the above described premises.

All real estate, fire protection and other taxes assessed against the herein conveyed premises for the year 1988 shall be paid by the Grantor as of the date of this deed.

IN WITNESS WHEREOF, Great Northern Nekoosa Corporation has caused this instrument to be signed in its corporate name and sealed by William R. Laidig, its Chairman and Chief Executive Officer, duly authorized this 16th day of December, 1988.

Witness:

GREAT NORTHERN NEKOOSA CORPORATION

By William R. Laidig

William R. Laidig
Its Chairman and Chief
Executive Officer

BK0708PG178

STATE OF CONNECTICUT

FAIRFIELD, ss. NORWALK December 16, 1988

Personally appeared the above-named William R. Laidig, Chairman and Chief Executive Officer, and acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of Great Northern Nekoosa Corporation.

Before me, Linda M. Brown

Notary Public
My Commission Expires Mar. 31, 1992

LINDA M. BROWN
Print or Type Name of Notary Public

SCHEDULE A

The following described tracts of land situated in Piscataquis County, to wit:

FIRST: TOWNSHIP A RANGE 10, WELS: A one-third (1/3) in common and undivided interest in Township A, Range 10 W.E.L.S. and all of the unlocated Public Lot acreage in said Township;

Excepting and Reserving to the Grantor, its successors and assigns, all right, title and interest of the Grantor to be taken by the United States of America in said Township as described in Lis Pendens dated October 5, 1987,and recorded in Piscataquis County Registry of Deeds, Book 655, Page 37, in the matter of United States of America vs. 1,205.00 acres of land, more or less, situated in the County of Piscataquis, State of Maine; Great Northern Paper Company; et als.

For Grantor's source of title see (1) the deed of Charles Stetson, Executor of the Will of Annie S. Stetson to Great Northern Paper Company dated January 13, 1930 and recorded in Piscataquis County Registry of Deeds, Book 234, Page 376, (2) the deed of Charles Stetson to Great Northern Paper Company dated January 13, 1930 and recorded in Book 234, Page 378, and (3) deed of the State of Maine dated December 28, 1984 and recorded in Book 573, Page 55.

SECOND: TOWNSHIP B RANGE 10, WELS: A one-third (1/3) in common and undivided interest in said Township B, Range 10, including the Philbrook Farm, so-called, and all of the unlocated Public Lot in said Township.

For Grantor's source of title see (1) deed of Charles Stetson, Executor under the Will of Annie Stetson dated January 13, 1930 and recorded in Piscataquis County Registry of Deeds Book 234, Page 376; (2) deed of Charles Stetson dated January 13, 1930 and recorded in Book 234, Page 378, (3) deed of Gerald E. Ladd dated June 10, 1975 and recorded in Book 431, Page 57; and (4) deed of the State of Maine dated December 28, 1984 and recorded in Book 573, Page 55.

THIRD: TOWNSHIP 2 RANGE 12, WELS, SOUTHEAST QUARTER: All of the southeast quarter of said Township more particularly bounded and described as follows:

Commencing at a corner post at the southeast corner of said

Township 2, Range 12; thence running westerly by and along the south town line of said Township for a distance of two hundred twenty-three and 61/100 (223.61) chains to a point on said south town line marked by a corner post; thence running northerly at a magnetic bearing of north twenty-five (25) degrees east for a distance of two hundred twenty-five and 63/100 (225.63) chains to a corner post; thence running easterly at a magnetic bearing of south seventy (70) degrees east for a distance of two hundred fifteen and 06/100 (215.06) chains to a point on the east town line of said Township which point is marked by a corner post; thence running southerly by and along said east town line for a distance of two hundred twenty-three and 61/100 (223.61) chains to the point of beginning at the southeast corner of said Township. Said premises above described contain approximately 4,930 acres and includes the minerals thereon. The above courses are magnetic north bearings as of 1981.

There is also hereby conveyed as appurtenant to the above described parcel, the right and easement conveyed by Barbara Cassidy, et al., to Edythe Rice Dyer by deed dated October 1, 1981 and recorded in the Piscataquis Registry of Deeds in Volume 520, Page 193, to which said deed reference may be had for a more particular description of the property subject to said right and easement. The right and easement includes the right to cross and recross with men and equipment for all purposes of ingress and egress over and across roads and ways as presently located or as may be reconstructed or relocated, said right of way and easement being limited to sixty-six (66) feet in width.

The above described parcel is conveyed subject to the right and easement conveyed by Edythe Rice Dyer to Barbara Cassidy, et al., by deed dated October 1, 1981 and recorded in the Piscataquis Registry of Deeds in Volume 520, Page 206, to which said deed reference may be had for a more particular description of the property subject to said right and easement. The right and easement includes the right to cross and recross with men and equipment for all purposes of ingress and egress over and across roads and ways as presently located or as may be reconstructed or relocated, said right of way and easement being limited to sixty-six (66) feet in width.

For Grantor's source of title see the deed of Edythe Rice Dyer dated February 13, 1984 and recorded in Piscataquis County Registry of Deeds Book 559, Page 360.

FOURTH: TOWNSHIP 2 RANGE 12, WELS, PUBLIC LOT: All of Public Lot in Township 2, Range 12 W.E.L.S. as conveyed to the Grantor herein by the State of Maine by deed dated December 28, 1984, and

recorded in Piscataquis County Registry of Deeds in Book 573, Page 55; to which deed reference may be had for a description of the premises hereby conveyed.

Excepting that portion of land laying between the normal high water mark of Chesuncook Lake as flooded by Ripogenus Dam under FERC Project No. 2572 (spillway crest of 941.59 feet U.S.G.S. vertical datum) and the elevation line of 943.00 feet U.S.G.S. vertical datum, as shown on a map by Great Northern Paper, titled Survey Plan, Sheet 1 of 2, dated March 1986, and recorded in the Piscataquis County Registry of Deeds in Plan Cabinet I, Number 30, amounting to approximately 2.3 acres; and

The Grantor, its successors and assigns, hereby agrees to convey to the Grantees, their respective heirs, successors or assigns, without additional consideration therefor, the Grantor's interest in the Project Lands at such time as Grantor, in its sole opinion, determines that said conveyance will not affect its right, interest or ability to operate any hydro-electric project now or in the future.

Further excepting certain flowage rights granted to West Branch Driving and Reservoir Dam Company by instruments dated July 28 and 31, 1908, and recorded Book 161, Pages 277 and 281.

FIFTH: TOWNSHIP 3 RANGE 12, WELS, (3 Tracts in the West Half):

All of each of three tracts, bounded on the west by the west townline of T3 R12 WELS and bounded to the north and east by the high water line of Chesuncook Lake and on the south by the high water line of Caribou Lake.

Excepting and reserving therefrom the following described parcel:

Beginning at a point in the west town line which is also the northeast corner of the parcel reserved in the T3 R13 S/2 conveyance; thence South 70° East, Magnetic bearing, to the high water line of Chesuncook Lake; thence southwesterly by and along said high water line to its intersection with the west townline;thence northerly by and along the west townline, to the point of beginning;and

Further excepting that portion of land laying between the normal high water mark of Chesuncook Lake as flooded by Ripogenus Dam under FERC Project No. 2572 (spillway crest of

941.59 feet, U.S.G.S. vertical datum) and the elevation line of 943.00 feet, U.S.G.S. vertical datum, as shown on a map by Great Northern Paper, titled Survey Plan, Sheet 1 of 2, dated March 1986, and recorded in the Piscataquis County Registry of Deeds in Plan Cabinet I, Number 30, amounting to approximately 7.7. acres;and

The Grantor, its successors and assigns, hereby agrees to convey to the Grantees, their respective heirs, successors or assigns, without additional consideration therefor, the Grantor's interest in the Project Lands at such time as Grantor, in its sole opinion, determines that said conveyance will not affect its right, interest or ability to operate any hydro-electric project now or in the future.

Further excepting certain flowage rights granted to the West Branch Driving and Reservoir Dam Company by instrument dated August 10, 1908 and recorded in Piscataquis County Registry of Deeds, Book 161, Page 375.

For the Grantor's source of title see (1) the deed of Frank H. Holyoke dated September 18, 1906 and recorded in Piscataquis County Registry of Deeds Book 149, Page 207, (2) the deed of Frederick H. Appleton et ux. dated July 1, 1920 and recorded in Book 204, Page 194, and (3) deed of the State of Maine dated November 12, 1975 and recorded in Book 434, Page 362.

SIXTH: TOWNSHIP 6 RANGE 12, WELS: The real estate situated in Township 6, Range 12, W.E.L.S. in the County of Piscataquis and State of Maine, more particularly bounded and described as follows:

Commencing at a point at the intersection of the west town line of said Township 6, Range 12, W.E.L.S. and the centerline of a gravel road referred to as the main haul road, said point being located one hundred nineteen and 50/100 (119.50) chains, more or less, northerly from the southwest corner of said township; thence running northerly by and along the west town line of said township for a distance of one hundred eighty-eight and 03/100 (188.03) chains to a corner post; thence turning and running easterly at a magnetic bearing of south seventy (70) degrees east along a blazed line for a distance of forty-four and 20/100 (44.20) chains to a post set at the high water mark on the west shore of Mud Pond; thence continuing to run easterly through Mud Pond on the same easterly course for a distance of one hundred thirty-six and 26/100 (136.26) chains to a post set at the high water mark on the east shore of Mud Pond; thence continuing to run on the same easterly course by and along a blazed line for a distance of one hundred thirty-four and 68/100 (134.68) chains to a corner post;

thence turning and running southerly at a magnetic bearing of south twenty (20) degrees west by and along a blazed line for a distance of eighty-six and 00/100 (86.00) chains to a point in the centerline of the aforesaid gravel road referred to as the main haul road; thence turning and running by and along the centerline of said main haul road for the following courses and distances, north seventy-seven (77) degrees west for a distance of thirty-six and 78/100 (36.78) chains; thence north seventy-nine (79) degrees west for a distance of twenty-one and 91/100 (21.91) chains; thence north eighty-one (81) degrees west for a distance of forty-seven and 41/100 (47.41) chains; thence north eighty-four (84) degrees west for a distance of thirteen and 47/100 (13.47) chains; thence north eighty-five (85) degrees west for a distance of seven and 18/100 (7.18) chains; thence north eighty-three (83) degrees west for a distance of eighteen and 88/100 (18.88) chains; thence north seventy-seven (77) degrees west for a distance of eighteen and 76/100 (18.76) chains; thence north eighty-eight (88) degrees west for a distance of five and 45/100 (5.45) chains; thence south eighty (80) degrees west for a distance of ten and 61/100 (10.61) chains; thence due west for a distance of fifty-one and 44/100 (51.44) chains; thence north eighty-six (86) degrees west for a distance of nineteen and 14/100 (19.14) chains; thence south eighty-eight (88) degrees west for a distance of twenty-eight and 88/100 (28.88) chains; thence due west for a distance of seventeen and 33/100 (17.33) chains; thence south eighty-seven (87) degrees west for a distance of fifteen and 24/100 (15.24) chains; thence south eighty (80) degrees west for a distance of seven and 90/100 (7.90) chains; thence south fifty-four degrees west for a distance of fifteen and fifty-eight (15.58) chains to a point at the intersection of the centerline of the main haul road and the west town line, said point also being the point of beginning. Said premises above described contains approximately 3,909 acres and includes the minerals thereon. The above courses are magnetic north bearings as of 1981.

There is also hereby conveyed as appurtenant to the above described parcel, the right and easement conveyed by Barbara Cassidy, et al., to Edythe Rice Dyer by deed dated October 1, 1981 and recorded in the Piscataquis Registry of Deeds in Volume 520, Page 193, to which said deed reference may be had for a more particular description of the property subject to said right and easement. The right and easement includes the right to cross and recross with men and equipment for all purposes of ingress and egress over and across roads and ways as presently located or as may be reconstructed or relocated, said right of way and easement being limited to sixty-six (66) feet in width.

The above described parcel is conveyed subject to the right and easement conveyed by Edythe Rice Dyer to Barbara

Cassidy, et al., by deed dated October 1, 1981 and recorded in the Piscataquis Registry of Deeds in Volume 520, Page 206, to which said deed reference may be had for a more particular description of the property subject to said right and easement. The right and easement includes the right to cross and recross with men and equipment for all purposes of ingress and egress over and across roads and ways as presently located or as may be reconstructed or relocated, said right of way and easement being limited to sixty-six (66) feet in width.

For Grantor's source of title see the deed of Edythe Rice Dyer dated February 13, 1984 and recorded in Book 559, Page 360 of the Piscataquis County Registry of Deeds.

SEVENTH: TOWNSHIP 3 RANGE 13, WELS,SOUTH HALF: All of a tract in the south half of Township 3, Range 13 W.E.L.S. lying along the east townline and bounded on the north by the division line described in deed of Northern Finance Corporation to Great Northern Paper Company dated December 17, 1926, and recorded in Piscataquis County Registry of Deeds in Volume 226, Page 346 and on the west and south by the high water line of Caribou Lake.

Excepting and reserving therefrom the following parcel as described:

Beginning at a cedar post set at the high water line on the east shore of Caribou Lake at a point which is five hundred feet (500.0') more or less from the point where the east townline intersects said high water line as measured by and along said high water line, thence South 70° East, Magnetic bearing, to a point in the east townline; thence southerly by and along said east townline to the high water line; thence northwesterly by and along said highwater line to the point of beginning. Said parcel is part of Recreation Area No. 3 in FERC project No. 2572.

Further excepting that portion of land laying between the normal high water mark of Caribou lake as flooded by Ripogenus Dam under FERC project No. 2572 (spillway crest of 941.59 feet U.S.G.S. vertical datum) and the elevation line of 943.00 feet, U.S.G.S. vertical datum, as shown on a map by Great Northern Paper, title Survey Plan, Sheet 1 of 2, dated March 1986, and recorded in the Piscataquis County Registry of Deeds in Plan Cabinet I, Number 30, amounting to approximately 4.7 acres; and

The Grantor, its successors and assigns, hereby agrees to

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convey to the Grantees, their respective heirs, successors or assigns, without additional consideration therefor, the Grantor's interest in the Project Lands at such time as Grantor, in its sole opinion, determines that said conveyance will not affect its right, interest or ability to operate any hydro-electric project now or in the future.

Further excepting certain flowage rights granted to the West Branch Driving and Reservoir Dam Company by instrument dated July 30, 1908, and recorded in Piscataquis County Registry of Deeds, Book 161, Page 337.

For Grantor's source of title see the deed of Northern Finance Corporation dated December 17, 1926 and recorded in Book 226, Page 346 of the Piscataquis County Registry of Deeds.

EIGHTH: TOWNSHIP 3 RANGE 13, WELS, NORTH HALF: A One-sixteenth (1/16) in common and undivided interest in said Township 3, Range 13 W.E.L.S. excepting the Morris Farm, said Farm being more fully described hereinafter as Parcel Ninth so-called; and

Further excepting that portion of land laying between the normal high water mark of Chesuncook and Caribou Lakes as flooded by Ripogenus Dam under FERC Project No. 2572 (spillway crest of 941.59 feet, U.S.G.S. vertical datum) and the elevation line of 943.00 feet, U.S.G.S. vertical datum, as shown on a map by Great Northern Paper, titled Survey Plan, Sheet 1 of 2, dated March, 1986, and recorded in the Piscataquis County Registry of Deeds in Plan Cabinet I, Number 30, amounting to approximately 72.8 acres;and

The Grantor, its successors and assigns, hereby agrees to convey to the Grantees, their respective heirs, successors or assigns, without additional consideration therefor, the Grantor's interest in the Project Lands at such time as Grantor, in its sole opinion, determines that said conveyance will not affect its right, interest or ability to operate any hydro-electric project now or in the future.

Further excepting all rights as granted in a charter to the Pine Stream Dam and Improvement Company on February 11,1913; and

Further excepting certain flowage rights granted to the West Branch Driving and Reservoir Dam Company by instrument dated July 30, 1908, and recorded in Piscataquis County Registry of Deeds, Book 161, Page 337.

For the Grantor's sources of title see the following: (1) deed of Ansel L. Lumbert to Great Northern Paper Company dated October 4, 1923 and recorded in Piscataquis County Registry of

Deeds Book 217, Page 336, and (2) deed of Barbara A. Cassidy et al dated October 15, 1985 and recorded in Book 393, Page 231.

NINTH: TOWNSHIP 3 RANGE 13, WELS,NORTH HALF (Morris Farm):All of the following described premises, in Township 3, Range 13 W.E.L.S., North Half, to wit:

A certain lot or parcel of land with all buildings thereon, situated in township number three in the thirteenth Range, West from the East line of the State in the County of Piscataquis, and bounded as follows, viz: Beginning at a spruce tree standing twenty-eight and two-thirds rods North 88 degrees east, from north east corner of dwelling house formerly occupied by Joseph Morris, marked "J.M. 1869"; thence north 75 degrees West one hundred and sixty rods to a fir tree marked "J.M. 1869"; thence south 15 degrees west one hundred rods to a small beach tree marked "J.M. 1869"; thence south 75 degrees east one hundred and sixty rods to a white maple tree marked "J.M. 1869"; thence North 15 degrees east one hundred rods to point begun at. Being the same premises conveyed to Edwin D. Southard by John Cassidy by deed, dated November 5th, A.D. 1891, and recorded in Piscataquis Registry for deeds, Vol. 111, Page 95.

For Grantor's source of title see the deed of Karl H. Shaw et al dated January 18, 1937 and recorded in Book 250, Page 264 of the Piscataquis County Registry of Deeds.

TENTH: TOWNSHIP 6 RANGE 14, WELS,SOUTH HALF: A One hundred ninety three-one-hundred ninety fifths (193/195) in common and undivided interest in the south half of Township 6, Range 14 W.E.L.S.; together with any interest the Grantor may have in the remaining 2/195 in common and undivided interest in the south half of said Township.

Excepting that portion of land laying between the normal highwater mark of Black Pond as flooded by Ripogenus Dam under FERC project No. 2572 (spillway crest of 941.59 feet U.S.G.S. vertical datum) and the elevation line of 943.00 feet, U.S.G.S. vertical datum, as shown on a map by G.N.P., titled Survey Plan, Sheet 2 of 2, dated March, 1986 and recorded in the Piscataquis County Registry of Deeds in Plan Cabinet I, Number 29, amount to approximately 0.0 acres; and

Further excepting and reserving to the Grantors, its successors and assigns, the fee title in the following

described land (approximately 1.9 acres) which lies between the normal high water mark of Caucomgomoc Lake and a line (the "Project Boundary") lying ten feet horizontally outside of the normal high water mark of Caucomgomoc Lake at an elevation equal to the elevation of the spillway crest of Caucomgomoc Dam, as it exists as of this date, which are project lands and waters ("Project Lands") included in Project No.2634, for which a license ("the License") has been issued to Grantor by the Federal Energy Regulatory Commission (the "FERC"). The use of and access to Project Lands is subject to regulation by the FERC.

(a) Grantee shall have free access, subject to the conditions described below, to the Project Lands for outdoor recreational purposes, including, but not limited to, navigation, fishing and hunting.

(b) Grantee shall, subject to the terms and conditions listed herein, have the right to use Project Lands for (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities; (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline; and (4) harvesting trees.

(c) Grantee's access to and use of the Project Lands shall be subject, in additions, to the following terms, conditions and limitations:

(i) Notwithstanding anything contained herein, Grantor reserves to itself, its successors and assigns, the right to use Project Lands for all purposes required of it as licensee for Project 2634.

(ii) The rights of access and use granted herein will not be used in any way that would endanger health, create a nuisance, or otherwise be incompatible with the recreational use or scenic, environmental, or recreational values of Project 2634.

(iii) In order to ensure that the construction, operation, and maintenance of any structures or facilities on or in Project Lands shall be conducted in a manner that will protect the scenic, recreational, and environmental values of Project 2634.

(a) Grantor, its successors and assigns, may take reasonable remedial action, at the direction of the FERC or upon its own initiative, for the protection and enhancement of the project's scenic, recreational, and environmental values; and

(b) Grantor, its successors and assigns, shall

have the right to inspect the site of any proposed construction, and to disapprove or to require reasonable modifications to that construction.

(d) Neither access to nor use of the Project Lands shall change the Project Boundary of Project 2634; unless such a change shall be approved by the FERC. Grantor may, but shall not be obligated to, apply for such approval; and in the event such approval is sought by Grantee, Grantee shall bear the reasonable costs, including attorneys' fees, thereof.

(e) Nothing herein contained shall be construed as imposing any term, condition or restriction upon the undivided interests owned by the Grantees herein prior to the delivery of this deed by virtue of FERC license - Project 2634; and

The Grantor, its successors and assigns, hereby agrees to convey to the Grantees, their respective heirs, successors or assigns, without additional consideration therefor, the Grantor's interest in the Project Lands at such time as Grantor, in its sole opinion, determines that said conveyance will not affect its right, interest or ability to operate any hydro-electric project now or in the future.

Further excepting a parcel of land described as follows:

Beginning at a point which is located on the west townline, 1 chain south of the high water line of the south shore of Loon Lake; thence S 70° E, a distance of 6 chains more or less to the centerline of the Loon Lake Road, so called; thence northwesterly, northerly and northwesterly, by and along said centerline of the Loon Lake Road to its intersection with the west townline; thence southerly by and along the west townline to the point of beginning; said parcel contains 35 acres more or less.

Further excepting certain flowage rights granted to the West Branch Driving and Reservoir Dam Company by instruments dated July 30, 1908, July 6, 1917 and October 9, 1917 and recorded in Piscataquis County Registry of Deeds in Book 161, Page 367, Book 189, Page 491, and Book 193, Page 120, respectively.

For the Grantor's source of title see (1) the deed of Thomas U. Coe dated August 19, 1910 and recorded in Piscataquis County Registry of Deeds Book 172, Page 94, (2) the deed of Northern Finance Corporation to Great Northern Paper Company dated December 17, 1926 and recorded in Book 226, Page 346, (3) the deed of James N. Chandler dated August 10, 1901 and recorded in Book 136, Page 344; (4) the deed of Charles Stetson, Executor under the Will of Annie S. Stetson dated January 13, 1930 and

recorded in Book 234, Page 376, and (5) the deed of Charles Stetson dated January 13, 1930 and recorded in Book 234, Page 378.

ELEVENTH: TOWNSHIP 4 RANGE 15, WELS, NORTH EAST PORTION: A One-half (1/2) in common and undivided interest in that tract in Township 4, Range 15 W.E.L.S. that lies north and east of the thread of Russell Stream and Cassidy Deadwater in said Township.

For the Grantor's source of title see the deed of Sara W. Richards et al dated December 31, 1984 and recorded in Piscataquis County Registry of Deeds Book 572, Page 394.

TWELFTH: EASEMENTS

Together with a right of way for all purposes of a way including but not limited to the right of ingress and egress for persons, vehicles and equipment and for the installation, maintainance and replacement of utilities, conduits and pipes whether above ground or underground to:

(1) Township B Range 10 WELS and Veazie Gore across or over the Grantor's timberlands in Township A Range 8 and Range 9 (Long A) on the "Jo-Mary Road", so-called, as it now exists or may in the future be relocated or reconstructed;

(2) Veazie Gore and Township A Range 10 WELS across or over the Grantor's timberlands in Township #4 of the Indian Purchase, so-called, on the "Turkey Tail Road", so-called, as it now exists or may in the future be relocated or reconstructed;

(3) Hopkins Academy (West half) across or over the Grantor's timberlands in Township #4 Indian Purchase and Township A Range 8 and Range 9 WELS (Long A) on the "Tolman Road", so-called, as it now exists or may in the future be relocated or reconstructed.

(4) Township 2 Range 8 (South half) across or over the Grantor's timberlands in Township #3 Indian Purchase and Township 1 Range 8 on the "Stacyville Road", so-called, as it now exists or may in the future be relocated or reconstructed.

The use of said roads shall be at the users own risk and no representation is made concerning the condition or safety of said roads either now or in the fture and no assurance is made that said roads will be maintained and/or kept usable by either the Grantor herein or the Grantees herein.

The use of said roads herein conveyed shall be subject to reasonable rules relating to the safety and maintenance of said roads, including road use fees, as may from time to time be imposed upon the users of said roads, by the party responsible

for the maintenance of said roads or rights of way.

The conveyance of the easement rights herein described does not in any way constitute a dedication to public use of said roads. If any of these easements should be conveyed by the Grantees, their heirs, personal representatives, successors or assigns, at any future date, to a public agency of any kind, then said easements shall be of no further force and effect.

PISCATAQUIS, SS. REC'D
88 DEC 30 PM 1:17

EXHIBIT D

Receipt # 105426
ERECORDED
BK 2829 PG 95
Instr # 2022-475
02/01/2022 12:13:01 PM
167 Pages

# MORTGAGE, FIXTURE FILING, ASSIGNMENT OF RENTS AND LEASES AND SECURITY AGREEMENT

from

GREAT LAKES HYDRO AMERICA, LLC, Mortgagor

to

THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A.,
as Collateral Agent, Mortgagee

DATED AS OF JANUARY 31, 2022

MORTGAGE, FIXTURE FILING, ASSIGNMENT OF RENTS AND LEASES AND SECURITY AGREEMENT

THIS MORTGAGE, FIXTURE FILING, ASSIGNMENT OF RENTS AND LEASES AND SECURITY AGREEMENT, dated as of January 31, 2022, is made by GREAT LAKES HYDRO AMERICA, LLC (formerly known as GNE, LLC), a Delaware limited liability company ("**Mortgagor**"), whose address is c/o Brookfield Renewable US, 200 Liberty Street, 14th Floor, New York, NY 10281, to THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., a national banking association, as Collateral Agent (together with its successors and assigns in such capacity as permitted under the Collateral Agency Agreement (as defined below), the **"Mortgagee"**), for the benefit of the Noteholders (as defined below), the Depository (as defined below), and the Mortgagee (collectively, the **"Secured Parties"**), and the address of the Mortgagee is 4655 Salisbury Road, Suite 300, Jacksonville, Florida 32256. References to this "**Mortgage**" shall mean this instrument and any and all renewals, modifications, amendments, supplements, restatements, extensions, consolidations, substitutions, spreaders and replacements of this instrument. References to the "**Collateral Agency Agreement**" mean the Collateral Agency Agreement of even date herewith among Mortgagor, Mortgagee, the purchasers of the Notes and The Bank of New York Mellon Trust Company, N.A., in its capacity as depository (the "**Depository**") under the Depository Agreement (as defined in the Note Purchase Agreement), as amended, restated or otherwise modified from time to time.

THE MAXIMUM AMOUNT SECURED BY THIS MORTGAGE, INCLUDING, WITHOUT LIMITATION, PRINCIPAL, INTEREST, MAKE-WHOLE AMOUNT, PREMIUM, COSTS OF COLLECTION, INCLUDING ATTORNEYS' FEES, FUTURE ADVANCES, ADDITIONAL INDEBTEDNESS, FUTURE PROMISSORY NOTES AND OTHER COSTS, EXCLUSIVE OF PROTECTIVE ADVANCES, IS SIX HUNDRED EIGHTY MILLION DOLLARS ($680,000,000.00).

Background

A. Mortgagor and the initial purchasers of the Notes described below (together with such purchasers' successors and assigns and any other holders from time to time of the Notes described below, the **"Noteholders"**) are entering into a Note Purchase Agreement, dated as of even date herewith (as amended, restated or otherwise modified from time to time, the **"Note Purchase Agreement"**), providing for the issue by Mortgagor of Mortgagor's (i) Senior Secured First Lien Fixed Rate Notes in the aggregate principal amount of $170,000,000.00 (including any notes delivered in substitution or exchange therefor, and as amended, restated or otherwise modified from time to time, collectively, the **"Fixed Rate Notes"**), and (ii) secured Additional Notes (as defined in the Note Purchase Agreement) now or hereafter issued in the principal amount or amounts authorized by the Note Purchase Agreement (the Fixed Rate Notes and the Additional Notes are collectively referred to herein as the "**Notes**"). In the event of any conflict between the provisions of this Mortgage and the provisions of the Note Purchase Agreement, the applicable provisions of the Note Purchase Agreement shall govern and control, provided, that in the case of a provision in this Mortgage

which is more specific and detailed than the related provision in the Note Purchase Agreement, such Mortgage provision shall not be deemed to be in conflict with the related provision in the Note Purchase Agreement; provided further, that this Mortgage shall control the description of the "Real Estate" and the "Premises" as those terms are hereinafter defined. Capitalized terms not otherwise defined herein shall have the meanings ascribed thereto in the Note Purchase Agreement.

B. Mortgagor is the owner of certain real property located in the counties of Penobscot, Piscataquis, and Somerset in the State of Maine described on Schedule A attached hereto (the "**Land**"), and the buildings, structures, and other improvements located thereon, including without limitation dams, powerhouses, gatehouses, gates, flashboards, spillways, penstocks, trash racks, waterways, walls, turbines, generators, substations, channels, water pools, stoplogs, lines for the transmission or distribution of electricity and/or communications, wires, cables, pipes, ducts, conduits, manholes, terminals, transformers, switches, pedestals, padmounts and fences (the "**Improvements**"; the Land and the Improvements being collectively referred to as the "**Real Estate**"); the Real Estate is also benefitted by certain flowage rights in Aroostook County, the State of Maine.

C. It is a condition precedent to the Purchasers' purchase of the Notes pursuant to the Note Purchase Agreement that Mortgagor grant the mortgage and assignment described herein, and Mortgagor wishes to grant such mortgage and assignment in favor of Mortgagee, for the benefit of the Secured Parties, as herein provided.

Granting Clauses

For good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Mortgagor agrees that to secure the prompt and complete payment of the principal of, interest, Make-Whole Amounts, if any, and premium, if any, on all of the Notes issued and delivered and outstanding under the Note Purchase Agreement, the payment of all other sums now or hereafter owing under the Notes, the Note Purchase Agreement, and each other Financing Document, and the performance of the covenants contained in the Note Purchase Agreement, this Mortgage and each of the other Financing Documents, as each of the foregoing may be varied, supplemented, amended or restated from time to time (collectively, and as so varied, supplemented, amended or restated, the "**Obligations**") when due (whether at stated maturity, by acceleration, because of mandatory prepayment, or otherwise, and including the payment of amounts which would become due but for the operation of the automatic stay under Section 362(a) of the Bankruptcy Code, 11 U.S.C. § 362(a)), and to induce the Purchasers to purchase the Notes,

MORTGAGOR HEREBY GRANTS TO MORTGAGEE, FOR THE BENEFIT OF THE SECURED PARTIES, A LIEN UPON AND A SECURITY INTEREST IN, AND HEREBY MORTGAGES, GRANTS, ASSIGNS, TRANSFERS AND SETS OVER TO MORTGAGEE, FOR THE BENEFIT OF THE SECURED PARTIES WITH MORTGAGE COVENANTS:

(A) the Land and all Improvements thereon;

(B) all right, title, and interest of Mortgagor in, to and under all flowage rights, easements, rights of way, gores of land, streets, ways, alleys, passages, sewer rights, waters, water courses, water and riparian rights, development rights, air rights, mineral rights and all estates, rights, titles, interests, privileges, licenses, tenements, hereditaments, and appurtenances belonging, relating, or appertaining to the Real Estate, and any rights or easements in gross in any way used useful in connection with the Real Estate, and any reversions, remainders, rents, issues, profits, and revenue thereof, and all land lying in the bed of any street, road or avenue, in front of or adjoining the Real Estate to the center line thereof (collectively, "**Appurtenances**");

(C) all estate, right, title, and interest of Mortgagor in and to all such tangible property now owned or hereafter acquired by Mortgagor (including all machinery, apparatus, equipment, fittings and articles of personal property) and now or hereafter located on or at or attached to the Real Estate such that an interest in such tangible property arises under applicable real estate law, and any and all products and accessions to any such property that may exist at any time (collectively, "**Fixtures**");

(D) all of the chattels, business machines, machinery, apparatus, equipment, furnishings, fittings and articles of tangible personal property of every kind and nature whatsoever, and all appurtenances and additions thereto and substitutions or replacements thereof (together with, in each case, attachments, components, parts and accessories) currently owned or subsequently acquired by Mortgagor and now or subsequently attached to, or contained in or used or usable in any way in connection with any operation or letting of the Real Estate, including, but without limiting the generality of the foregoing, turbines, generators, transformers, busses, generator leads, gates, switches, poles, guys, electric lines, water flow and water level monitoring equipment, booms, boom anchors, trash racks, flash boards, wires, controls, relays, meters, regulators, circuit breakers, cross-arms, valves, fans, compressors and battery systems, and also including all heating, electrical, and mechanical equipment, lighting, switchboards, plumbing, ventilating, air conditioning and air-cooling apparatus, loading and unloading equipment and systems, communication systems (including satellite dishes and antennae), computers, sprinkler systems and other fire prevention and extinguishing apparatus and materials, security systems, motors, engines, machinery, pipes, pumps, tanks, conduits, appliances, fittings and fixtures of every kind and description (all of the foregoing in this paragraph (D) being referred to as the "**Equipment**");

(E) all right, title, and interest of Mortgagor in and to all substitutes and replacements of, and all additions and improvements to, the Real Estate, Appurtenances, Fixtures and Equipment, subsequently acquired by or released to Mortgagor or constructed, assembled, or placed by Mortgagor on the Real Estate, immediately upon such acquisition, release, construction, assembling, or placement, including, without limitation, any and all building materials whether stored at the Real Estate or offsite, and, in each such case, without any further mortgage, conveyance, assignment or other act by Mortgagor;

(F) all right, title and interest of Mortgagor in, to and under all leases, subleases, underlettings, concession agreements, management agreements, licenses and

other agreements relating to the use or occupancy of the Real Estate or the Appurtenances or Fixtures or the Equipment or any part thereof, now existing or subsequently entered into by Mortgagor and whether written or oral, and all guarantees of any of the foregoing (collectively, as any of the foregoing may be amended, restated, extended, renewed or modified from time to time, the "**Leases**"), and all rights of Mortgagor in respect of cash and securities deposited thereunder and the right to receive and collect the revenues, income, rents, issues and profits thereof, together with all other rents, royalties, issues, profits, revenue, income and other benefits arising from the use and enjoyment of the Mortgaged Property (as defined below) (collectively, the "**Rents**");

(G) any and all rights to payment of money, including under contracts for the sale of energy, all rights in Federal Energy Regulatory Commission licenses, applicable permits and water supply agreements;

(H) any and all rights in plans, specifications, insurance proceeds, condemnation or eminent domain payments, cash and investments, all contracts relating to ownership, operation and management of the Real Estate, the Appurtenances, the Fixtures or the Equipment;

(I) all proceeds, both cash and noncash, of the foregoing; and

(J) any and all other rights or interests described in Schedule A:

(All of the foregoing property and rights and interests now owned or held or subsequently acquired by Mortgagor and described in the foregoing clauses (A) through (E) are collectively referred to as the "**Premises**", and those described in the foregoing clauses (A) through (J) are collectively referred to as the "**Mortgaged Property.**")

Also granting to Mortgagee hereby the right, upon the occurrence of an Event of Default, to foreclose and sell the aforesaid Mortgaged Property by any means permitted by law, including pursuant to the STATUTORY POWER OF SALE.

TO HAVE AND TO HOLD THE MORTGAGED PROPERTY AND THE RIGHTS AND PRIVILEGES HEREBY MORTGAGED UNTO MORTGAGEE, ITS SUCCESSORS AND ASSIGNS, FOR THE BENEFIT OF THE SECURED PARTIES, TO ITS USE AND BEHOOF FOREVER. Provided, however, that the condition of this Mortgage is such that if the Obligations are fully paid and performed, then this Mortgage shall be of no further force and effect.

Terms and Conditions

Mortgagor further represents, warrants, covenants and agrees with Mortgagee as follows:

1. Warranty of Title. Mortgagor warrants that it has good title to its estates and interests in and to the Mortgaged Property and holds valid and subsisting easements, rights of way or other use or possessory rights in respect of the lands adjacent to the Land owned in fee

simple by Mortgagor that are sufficient for the intended use, operations, and maintenance of Mortgagor's facilities, in each case subject only to the matters that are set forth in Schedule B attached hereto (the "**Permitted Exceptions**").

2. Payment and Performance of the Obligations. Mortgagor shall pay and perform the Obligations at the times and places and in the manner specified in the Notes, the Note Purchase Agreement, and the other Financing Documents to which it is a party, including this Mortgage.

3. Requirements. (a) Mortgagor shall promptly comply with, or cause to be complied with, and conform to all present and future laws, statutes, codes, ordinances, orders, judgments, decrees, rules, regulations and requirements, and irrespective of the nature of the work to be done, of each of the United States of America, any State and any municipality, local government or other political subdivision thereof and any agency, department, bureau, board, commission or other instrumentality of any of them, now existing or subsequently created (collectively, "**Governmental Authority**") which has jurisdiction over the Mortgaged Property and all covenants, restrictions and conditions now or later of record which may be applicable to any of the Mortgaged Property, or to the use, manner of use, occupancy, possession, operation, maintenance, alteration, repair or reconstruction of any of the Mortgaged Property, except to the extent that failure to comply therewith could not, in the aggregate, reasonably be expected to have a Material Adverse Change. All present and future laws, statutes, codes, ordinances, orders, judgments, decrees, rules, regulations and requirements of every Governmental Authority applicable to Mortgagor or to any of the Mortgaged Property and all covenants, restrictions, and conditions which now or later may be applicable to any of the Mortgaged Property are collectively referred to as the "**Legal Requirements.**"

(b) From and after the date of this Mortgage, Mortgagor shall not by act or omission permit any new building or other new improvement on any premises not subject to the lien of this Mortgage to rely on any portion of the Real Estate then constituting a separate lot of record to fulfill any Legal Requirement so as to impair the ability of such portion to be sold as a separate lot, and Mortgagor hereby assigns to Mortgagee any and all rights to give consent for all or any portion of the Real Estate or any interest therein to be so used. Mortgagor shall not by act or omission impair the integrity of any of the Real Estate so as to constitute an illegal subdivision or to prohibit any portion of the Real Estate previously constituting a separate lot of record from being conveyed as a separate lot for purposes of applicable zoning or tax lot and subdivision ordinances. Mortgagor represents that no portion of the Real Estate is part of a larger tract of land constituting a separate lot of record that includes any land or improvements that are not part of the Real Estate, or that, in regard to any such portion that may exist, any authorization or variance required for the subdivision of such larger tract which a sale of the Real Estate would entail has been obtained from all appropriate Governmental Authorities so that the Real Estate will be entirely comprised of separate lots of record capable of being conveyed as such. Any act or omission by Mortgagor which would result in a violation of any of the provisions of this subsection shall be void.

4. Payment of Taxes and Other Impositions. (a) Promptly when due, but in any event before any delinquency occurs, Mortgagor shall pay and discharge all taxes of every

kind and nature (including, without limitation, all real and personal property, income, franchise, withholding, transfer, gains, profits and gross receipts taxes), all charges for any easement or agreement maintained for the benefit of any of the Mortgaged Property, all general and special assessments, levies, permits, inspection and license fees, all water and sewer rents and charges, vault taxes, and all other public charges even if unforeseen or extraordinary, imposed upon or assessed against or which may become a lien on any of the Mortgaged Property, or arising in respect of the occupancy, use or possession thereof, together with any penalties or interest on any of the foregoing (all of the foregoing are collectively referred to as the "**Impositions**"). Mortgagor shall promptly deliver to Mortgagee (i) original or copies of receipted bills and cancelled checks evidencing payment of such Imposition if it is a real estate tax or other public charge and (ii) evidence showing the payment of any other such Imposition. If by law any Imposition, at Mortgagor's option, may be paid in installments (whether or not interest shall accrue on the unpaid balance of such Imposition), Mortgagor may elect to pay such Imposition in such installments and shall be responsible for the payment of such installments with interest, if any.

(b) Nothing herein shall affect any right or remedy (which shall not be deemed to be an obligation) of Mortgagee under this Mortgage or otherwise, without notice or demand to Mortgagor, to pay any Imposition after the date such Imposition shall have become delinquent. Any sums paid by Mortgagee in discharge of any Impositions shall be payable on demand by Mortgagor to Mortgagee together with interest at the Default Rate.

(c) Mortgagor shall have the right before any delinquency occurs to contest or object in good faith to the amount or validity of any Imposition by appropriate legal proceedings, but such right shall not be deemed or construed in any way as relieving, modifying, or extending Mortgagor's covenant to pay any such Imposition at the time and in the manner provided in this Section unless (i) Mortgagor has given prior written notice to Mortgagee of Mortgagor's intent so to contest or object to an Imposition, (ii) Mortgagor shall demonstrate to Mortgagee's satisfaction (acting at the written direction of the Required Holders) that the legal proceedings shall operate conclusively to prevent the sale of the Mortgaged Property, or any part thereof, to satisfy such Imposition prior to final determination of such proceedings and (iii) Mortgagor shall furnish evidence of compliance with Section 8.4 of the Note Purchase Agreement or shall furnish a good and sufficient bond or surety reasonably satisfactory to Mortgagee (acting at the written direction of the Required Holders) in the amount of the Impositions which are being contested plus any interest and penalty which may be imposed thereon and which could become a lien against the Real Estate or any part of the Mortgaged Property.

5. Insurance. (a) Mortgagor shall maintain or cause to be maintained on all of the Premises such insurance in such amounts as is required pursuant to the Note Purchase Agreement.

(b) In the event of foreclosure of this Mortgage or other transfer of title to the Mortgaged Property, all right, title and interest of Mortgagor in and to any insurance policies then in force shall pass to the purchaser or grantee.

6. Restrictions on Liens and Encumbrances. Except for the lien of this Mortgage and the Permitted Exceptions, and except as expressly permitted under the Note Purchase Agreement, Mortgagor shall not further mortgage, nor otherwise encumber the Mortgaged Property nor create or suffer to exist any lien, charge or encumbrance on the Mortgaged Property, or any part thereof, whether superior or subordinate to the lien of this Mortgage and whether recourse or non-recourse.

7. Due on Sale and Other Transfer Restrictions. Except as expressly permitted under the Note Purchase Agreement, Mortgagor shall not sell, transfer, convey or assign all or any portion of, or any interest in, the Mortgaged Property.

8. Maintenance; No Alteration; Inspection; Utilities. (a) Mortgagor shall keep the Premises in good working order and condition, ordinary wear and tear excepted and operate and maintain the Mortgaged Property in accordance with Section 8.3 of the Note Purchase Agreement. Mortgagee (acting at the written direction of the Required Holders) and any persons authorized by Mortgagee upon notice given reasonably in advance shall have the right (subject to any restrictions thereupon which may be contained in any Lease) at any reasonable time and as often as may reasonably be desired to enter and inspect the Premises and all work done, labor performed and materials furnished in and about the Improvements and to inspect and make abstracts of all books, contracts and records of Mortgagor relating to the Mortgaged Property.

(b) Mortgagor shall pay or cause to be paid when due all utility charges which are incurred for gas, electricity, water or sewer services furnished to the Premises and all other assessments or charges of a similar nature, whether public or private, affecting the Premises or any portion thereof, whether or not such assessments or charges are liens thereon, except to the extent any such charge, assessment or other similar obligation shall be the obligation of the lessee under any Lease.

9. Condemnation/Eminent Domain. Promptly upon obtaining knowledge of the institution of any proceedings for the condemnation of the Mortgaged Property, or any portion thereof, Mortgagor will notify Mortgagee of the pendency of such proceedings.

10. Leases. (a) Except as may be expressly permitted under the Note Purchase Agreement, Mortgagor shall not (i) execute an assignment or pledge of any Lease relating to all or any portion of the Mortgaged Property other than in favor of Mortgagee or (ii) enter into any Lease of the Mortgaged Property without Mortgagee's consent (acting at the written direction of the Required Holders).

(b) If Mortgagor shall enter into any Leases, Mortgagor shall deliver to Mortgagee on or before January 15 of each year, commencing January 15, 2023, a written statement, certified by Mortgagor as being true, correct and complete, containing the names of all lessees and other occupants of the Mortgaged Property, the terms of all Leases and the spaces occupied and rentals payable thereunder, and a list of all Leases which are then in default, including the nature and magnitude of the default. Mortgagor shall also promptly deliver written

notice to Mortgagee of any new Leases, Lease terminations, Lease defaults, or material changes in any Leases.

11. Further Assurances. To further assure Mortgagee's rights under this Mortgage, Mortgagor agrees upon demand of Mortgagee (acting at the written direction of the Required Holders) to do any act or execute any additional documents (including, but not limited to, security agreements on any personalty included or to be included in the Mortgaged Property and a separate assignment of each Lease in recordable form) as may be reasonably required by Mortgagee (acting at the written direction of the Required Holders) to confirm the lien of this Mortgage and all other rights or benefits conferred on Mortgagee.

12. Mortgagee's Right to Perform. If Mortgagor fails to perform any of the covenants or agreements of Mortgagor within the applicable notice and grace period, if any, Mortgagee, without waiving or releasing Mortgagor from any obligation or default under this Mortgage, may at any time (but shall be under no obligation to) pay or perform the same, and the amount or cost thereof, with interest at the Default Rate, shall immediately be due from Mortgagor to Mortgagee. To the extent that any such amounts or costs paid by Mortgagee shall constitute payment of (i) Impositions; (ii) premiums on insurance policies covering the Premises; (iii) expenses incurred in upholding or enforcing the lien of this Mortgage, including, but not limited to the expenses of any litigation to prosecute or defend the rights and lien created by this Mortgage; (iv) costs of removal of or otherwise related to Hazardous Substances; or (v) any amount, costs or charge to which Mortgagee becomes subrogated, upon payment, whether under recognized principles of law or equity, or under express statutory authority; then, and in each such event, such amounts or costs, together with interest thereon at the Default Rate, shall be added to the Obligations and shall be secured by this Mortgage and shall be a lien on the Mortgaged Property prior to any right, title to, interest in, or claim upon the Mortgaged Property attaching subsequent to the lien of this Mortgage. No payment or advance of money by Mortgagee under this Section shall be deemed or construed to cure Mortgagor's default or waive any right or remedy of Mortgagee.

13. Events of Default. The occurrence of an Event of Default under the Note Purchase Agreement shall constitute an Event of Default hereunder.

14. Remedies. (a) Upon the occurrence of any Event of Default, in addition to any other rights and remedies Mortgagee may have pursuant to Section 18 of this Mortgage or pursuant to the Financing Documents, or as provided by law, and without limitation, Mortgagee (acting at the written direction of the Required Holders) may immediately take such action, without notice or demand, as it deems advisable to protect and enforce its rights against Mortgagor and in and to the Mortgaged Property, including, but not limited to, the following actions, each of which may be pursued concurrently or otherwise, at such time and in such manner as Mortgagee (acting at the written direction of the Required Holders) may determine, in the Required Holders' sole discretion, without impairing or otherwise affecting the other rights and remedies of Mortgagee:

(i) Mortgagee may, to the extent permitted by applicable law, (A) institute and maintain an action of mortgage foreclosure against all or any part of the

Mortgaged Property, (B) institute and maintain an action on the Notes or any other Financing Document, (C) sell all or part of the Mortgaged Property (Mortgagor expressly granting to Mortgagee the STATUTORY POWER OF SALE), or (D) take such other action at law or in equity for the enforcement of this Mortgage or any of the Financing Documents as the law may allow. Mortgagee may proceed in any such action to final judgment and execution thereon for all sums due hereunder, together with interest thereon at the Default Rate and all costs of suit, including, without limitation, reasonable attorneys' fees and disbursements. Interest at the Default Rate shall be due on any judgment obtained by Mortgagee from the date of judgment until actual payment is made of the full amount of the judgment.

(ii) Mortgagee may personally, or by its agents, attorneys and employees and without regard to the adequacy or inadequacy of the Mortgaged Property or any other collateral as security for the Obligations enter into and upon the Mortgaged Property and each and every part thereof and exclude Mortgagor and its agents and employees therefrom without liability for trespass, damage or otherwise (Mortgagor hereby agreeing to surrender possession of the Mortgaged Property to Mortgagee upon demand at any such time) and use, operate, manage, maintain and control the Mortgaged Property and every part thereof. Following such entry and taking of possession, Mortgagee shall be entitled, without limitation, (x) to lease all or any part or parts of the Mortgaged Property for such periods of time and upon such conditions as Mortgagee may, in its discretion, deem proper, (y) to enforce, cancel or modify any Lease and (z) generally to execute, do and perform any other act, deed, matter or thing concerning the Mortgaged Property as Mortgagee shall deem appropriate as fully as Mortgagor might do; and Mortgagor hereby appoints and constitutes Mortgagee its attorney-in-fact to do or accomplish any such actions in Mortgagor's name, such power of attorney being coupled with an interest and irrevocable.

(iii) Mortgagee may sell all or any part of the Mortgaged Property pursuant to the STATUTORY POWER OF SALE in some place in any municipality in which any part of the Mortgaged Property is located, at one or more sales, in whole or in parcels, in any order or manner, at such time and place, upon such terms and after such notice thereof as may be required or permitted by law, at the discretion of Mortgagee. In the event of a sale, by foreclosure or otherwise, of less than all of the Mortgaged Property, this Mortgage shall continue as a lien on the remaining portion of the Mortgaged Property.

(b) The holder of this Mortgage, in any action to foreclose it, shall be entitled to the appointment of a receiver. In case of a foreclosure sale, the Mortgaged Property may be sold, at Mortgagee's election (acting at the written direction of the Required Holders), in one parcel or in more than one parcel and Mortgagee (acting at the written direction of the Required Holders) is specifically empowered, (without being required to do so, and in the Required Holders' sole and absolute discretion) to cause successive sales of portions of the Mortgaged Property to be held.

(c) In the event of any breach of any of the covenants, agreements, terms or conditions contained in this Mortgage, and notwithstanding to the contrary any exculpatory or non-recourse language which may be contained herein, Mortgagee (acting at the written direction of the Required Holders) shall be entitled to enjoin such breach and obtain specific performance of any covenant, agreement, term or condition and Mortgagee (acting at the written direction of the Required Holders) shall have the right to invoke any equitable right or remedy as though other remedies were not provided for in this Mortgage.

15. Right of Mortgagee to Credit Sale. Upon the occurrence of any sale made under this Mortgage, whether made under the power of sale or by virtue of judicial proceedings or of a judgment or decree of foreclosure and sale, Mortgagee may bid for and acquire the Mortgaged Property or any part thereof. In lieu of paying cash therefor, Mortgagee may make settlement for the purchase price by crediting upon the Obligations or other sums secured by this Mortgage the net sales price after deducting therefrom the expenses of sale and the cost of the action and any other sums which Mortgagee is authorized to deduct under this Mortgage. In such event, this Mortgage, the Note Purchase Agreement, the Notes, and documents evidencing expenditures secured hereby may be presented to the person or persons conducting the sale in order that the amount so used or applied may be credited upon the Obligations as having been paid.

16. Appointment of Receiver. If an Event of Default shall have occurred and be continuing, Mortgagee (acting at the written direction of the Required Holders) as a matter of right and without notice to Mortgagor, unless otherwise required by applicable law, and without regard to the adequacy or inadequacy of the Mortgaged Property or any other collateral as security for the Obligations or the interest of Mortgagor therein, shall have the right to apply to any court having jurisdiction to appoint a receiver or receivers or other manager of the Mortgaged Property, and Mortgagor hereby irrevocably consents to such appointment and waives notice of any application therefor (except as may be required by law). Any such receiver or receivers shall have all the usual powers and duties of receivers in like or similar cases and all the powers and duties of Mortgagee in case of entry as provided in this Mortgage, including, without limitation and to the extent permitted by law, the right to enter into leases of all or any part of the Mortgaged Property, and shall continue as such and exercise all such powers until the date of confirmation of sale of the Mortgaged Property unless such receivership is sooner terminated.

17. Extension, Release, etc. (a) Without affecting the lien or charge of this Mortgage upon any portion of the Mortgaged Property not then or theretofore released as security for the full amount of the Obligations, Mortgagee (acting at the written direction of the Required Holders) may, from time to time and without notice, agree to (i) release any person liable for the Obligations under the Note Purchase Agreement or any other Financing Document, (ii) extend the maturity or alter any of the terms of the indebtedness guaranteed under any guaranty of the Obligations, (iii) grant other indulgences, (iv) release or reconvey, or cause to be released or reconveyed at any time at Mortgagee's option (acting at the written direction of the Required Holders) any parcel or portion or all of the Mortgaged Property, (v) take or release any other or additional security for any obligation herein mentioned, or (vi) make compositions or other arrangements with debtors in relation thereto. If at any time this Mortgage shall secure less

than all of the principal amount of the Obligations, it is expressly agreed that any repayments of the principal amount of the Obligations shall not reduce the amount of the lien of this Mortgage until the lien amount shall equal the principal amount of the Obligations outstanding.

(b) No recovery of any judgment by Mortgagee and no levy of an execution under any judgment upon the Mortgaged Property or upon any other property of Mortgagor shall affect the lien of this Mortgage or any liens, rights, powers or remedies of Mortgagee hereunder, and such liens, rights, powers and remedies shall continue unimpaired.

(c) If Mortgagee shall have the right to foreclose this Mortgage, Mortgagor authorizes Mortgagee (acting at the written direction of the Required Holders) to foreclose the lien of this Mortgage, at the Required Holders' option, either against or subject to the rights of any tenants of the Mortgaged Property. The failure to make any such tenants parties defendant to any such foreclosure proceeding and to foreclose their rights will not be asserted by Mortgagor as a defense to any proceeding instituted by Mortgagee to collect the Obligations or to foreclose the lien of this Mortgage.

(d) Unless expressly provided otherwise, in the event that ownership of this Mortgage and title to the Mortgaged Property or any estate therein shall become vested in the same person or entity, this Mortgage shall not merge in such title but shall continue as a valid lien on the Mortgaged Property for the amount secured hereby.

18. Security Agreement under Uniform Commercial Code. (a) It is the intention of the parties hereto that this Mortgage shall constitute a Security Agreement within the meaning of the Uniform Commercial Code of the State of Maine (the "**Code**"). Upon the occurrence of an Event of Default, then in addition to having any other right or remedy available at law or in equity, Mortgagee (acting at the written direction of the Required Holders) shall have the option of either (i) proceeding under the Code and exercising such rights and remedies as may be provided to a secured party by the Code with respect to all or any portion of the Mortgaged Property which is personal property (including, without limitation, taking possession of and selling such property) or (ii) treating such property as real property and proceeding with respect to both the real and personal property constituting the Mortgaged Property in accordance with Mortgagee's rights, powers and remedies with respect to the real property (in which event the default provisions of the Code shall not apply). If Mortgagee (acting at the written direction of the Required Holders) shall elect to proceed under the Code, then ten days' notice of sale of the personal property shall be deemed reasonable notice and the reasonable expenses of retaking, holding, preparing for sale, selling and the like incurred by Mortgagee shall include, but not be limited to, attorneys' fees and legal expenses. At Mortgagee's request (acting at the written direction of the Required Holders), Mortgagor shall assemble the personal property and make it available to Mortgagee at a place designated by Mortgagee which is reasonably convenient to both parties.

(b) Mortgagor and Mortgagee agree, to the extent permitted by law, that: (i) all of the goods described within the definition of the word "Fixtures" are or are to become fixtures on the Real Estate; (ii) this Mortgage upon recording or registration in the real estate records of the proper office shall constitute a financing statement filed as a "fixture filing"

within the meaning of Sections 9-334 and 9-502 of the Code; (iii) Mortgagor is the record owner of the Real Estate; and (iv) the addresses of Mortgagor and Mortgagee are as set forth on the first page of this Mortgage.

(c) Mortgagor, upon request by Mortgagee (acting at the written direction of the Required Holders) from time to time, shall execute, acknowledge and deliver to Mortgagee one or more separate security agreements, in form satisfactory to Mortgagee (acting at the written direction of the Required Holders), covering all or any part of the Mortgaged Property and will further execute, acknowledge and deliver, or cause to be executed, acknowledged and delivered, any affidavit or certificate or other document as Mortgagee (acting at the written direction of the Required Holders) may request in order to perfect, preserve, maintain, continue or extend the security interest under and the priority of this Mortgage and such security instrument. Mortgagor further agrees to pay to Mortgagee on demand all costs and expenses incurred by Mortgagee in connection with the preparation, execution, recording, filing and re-filing of any such document and all reasonable costs and expenses of any record searches for financing statements Mortgagee (acting at the written direction of the Required Holders) shall reasonably require. Mortgagor hereby authorizes Mortgagee, without obligation and only if the Mortgagor does not file in the first instance, to file any financing statements and amendments thereto covering all or any part of the Mortgaged Property. The filing of any financing statements or amendments thereto or continuation statements with respect thereto in the records relating to personal property or chattels shall not be construed as in any way impairing the right of Mortgagee to proceed against any personal property encumbered by this Mortgage as real property, as set forth above.

(d) Mortgagor forthwith upon the execution and delivery of this Mortgage and thereafter, from time to time, will cause this Mortgage and any of the other Financing Documents creating a lien or security interest or evidencing the lien hereof upon the Mortgaged Property and each instrument of further assurance to be filed, registered or recorded in such manner and in such places as may be required by any present or future law in order to publish notice of and fully to protect and perfect the lien or security interest hereof upon, and the interest of Mortgagee in, the Mortgaged Property. Mortgagor will pay all taxes, filing, registration or recording fees, and all expenses incident to the preparation, execution, acknowledgment and/or recording of the Notes, this Mortgage, the other Financing Documents, any note, deed to secure debt, deed of trust or mortgage supplemental hereto, any Mortgage with respect to the Mortgaged Property and any instrument of further assurance, and any modification or amendment of any of the foregoing documents, and all federal, state, county and municipal taxes, duties, imposts, assessments and charges arising out of or in connection with the execution and delivery of this Mortgage, any deed of trust, deed to secure debt or mortgage supplemental hereto, any Mortgage with respect to the Mortgaged Property or any instrument of further assurance, and any modification or amendment of any of the foregoing documents, except where prohibited by law so to do.

19. Assignment of Rents. Mortgagor hereby assigns to Mortgagee the Rents as further security for the payment and performance of the Obligations, and Mortgagor grants to Mortgagee the right to enter the Mortgaged Property for the purpose of collecting the same and to let the Mortgaged Property or any part thereof, and to apply the Rents on account of the Obligations. The foregoing assignment and grant is present and absolute and shall continue in

effect until the Obligations are paid and performed in full, but Mortgagee hereby waives the right to enter the Mortgaged Property for the purpose of collecting the Rents and Mortgagor shall be entitled to collect, receive, use and retain the Rents until the occurrence of an Event of Default under this Mortgage; such right of Mortgagor to collect, receive, use and retain the Rents may be revoked by Mortgagee upon the occurrence of any Event of Default under this Mortgage by giving not less than ten days' written notice of such revocation to Mortgagor; in the event such notice is given, Mortgagor shall pay over to Mortgagee, or to any receiver appointed to collect the Rents, any lease security deposits, and shall pay monthly in advance to Mortgagee, or to any such receiver, the fair and reasonable rental value as determined by Mortgagee for the use and occupancy of the Mortgaged Property or of such part thereof as may be in the possession of Mortgagor or any affiliate of Mortgagor, and upon default in any such payment Mortgagor and any such affiliate will vacate and surrender the possession of the Mortgaged Property to Mortgagee or to such receiver, and in default thereof may be evicted by summary proceedings or otherwise.

20. Trust Funds. All lease security deposits of the Real Estate shall be treated as trust funds not to be commingled with any other funds of Mortgagor. Within 10 days after request by Mortgagee (acting at the written direction of the Required Holders), Mortgagor shall furnish Mortgagee satisfactory evidence of compliance with this subsection, together with a statement of all lease security deposits by lessees and copies of all Leases not previously delivered to Mortgagee, which statement shall be certified by Mortgagor.

21. Additional Rights. The holder of any subordinate lien on the Mortgaged Property shall have no right to terminate any Lease whether or not such Lease is subordinate to this Mortgage nor shall any holder of any subordinate lien join any tenant under any Lease in any action to foreclose the lien or modify, interfere with, disturb or terminate the rights of any tenant under any Lease. By recordation of this Mortgage all subordinate lienholders are subject to and notified of this provision, and any action taken by any such lienholder contrary to this provision shall be null and void. Upon the occurrence of any Event of Default, Mortgagee (acting at the written direction of the Required Holders) may, in the Required Holders' sole discretion and without regard to the adequacy of its security under this Mortgage, apply all or any part of any amounts on deposit with Mortgagee under this Mortgage against all or any part of the Obligations. Any such application shall not be construed to cure or waive any Default or Event of Default or invalidate any act taken by Mortgagee on account of such Default or Event of Default.

22. Notices. All notices, requests, demands and other communications hereunder shall be given in accordance with the provisions of Section 17 of the Note Purchase Agreement to Mortgagor and to Mortgagee as specified therein.

23. No Oral Modification. This Mortgage may not be amended, supplemented or otherwise modified except by an instrument in writing executed by Mortgagor and Mortgagee in accordance with the provisions of Section 16 of the Note Purchase Agreement. Any agreement made by Mortgagor and Mortgagee after the date of this Mortgage relating to this Mortgage shall be superior to the rights of the holder of any intervening or subordinate lien or encumbrance.

24. Partial Invalidity. In the event any one or more of the provisions contained in this Mortgage shall for any reason be held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provision hereof, but each shall be construed as if such invalid, illegal or unenforceable provision had never been included. Notwithstanding to the contrary anything contained in this Mortgage or in any provisions of any of the Financing Documents, the obligations of Mortgagor and of any other obligor under any Financing Document shall be subject to the limitation that Mortgagee shall not charge, take or receive, nor shall Mortgagor or any other obligor be obligated to pay to Mortgagee, any amounts constituting interest in excess of the maximum rate permitted by law to be charged by Mortgagee.

25. Mortgagor's Waiver of Rights. To the fullest extent permitted by law, Mortgagor waives the benefit of all laws now existing or that may subsequently be enacted providing for (a) any appraisement before sale of any portion of the Mortgaged Property, (b) any extension of the time for the enforcement of the collection of the Obligations or the creation or extension of a period of redemption from any sale made in collecting such debt and (c) exemption of the Mortgaged Property from attachment, levy or sale under execution or exemption from civil process. To the full extent Mortgagor may do so, Mortgagor agrees that Mortgagor will not at any time insist upon, plead, claim or take the benefit or advantage of any law now or hereafter in force providing for any appraisement, valuation, stay, exemption, extension or redemption, or requiring foreclosure of this Mortgage before exercising any other remedy granted hereunder and Mortgagor, for Mortgagor and its successors and assigns, and for any and all persons ever claiming any interest in the Mortgaged Property, to the extent permitted by law, hereby waives and releases all rights of redemption, valuation, appraisement, stay of execution, and marshalling in the event of foreclosure of the liens hereby created.

26. Remedies Not Exclusive. Mortgagee shall be entitled to enforce payment and performance of the Obligations and to exercise all rights and powers under this Mortgage or under any of the other Financing Documents or other agreement or any laws now or hereafter in force, notwithstanding that some or all of the Obligations may now or hereafter be otherwise secured, whether by mortgage, security agreement, pledge, lien, assignment or otherwise. Neither the acceptance of this Mortgage nor its enforcement, shall prejudice or in any manner affect Mortgagee's right to realize upon or enforce any other security now or hereafter held by Mortgagee, it being agreed that Mortgagee shall be entitled to enforce this Mortgage and any other security now or hereafter held by Mortgagee in such order and manner as Mortgagee (acting at the written direction of the Required Holders) may determine in the Required Holders' absolute discretion. No remedy herein conferred upon or reserved to Mortgagee is intended to be exclusive of any other remedy herein or by law provided or permitted, but each shall be cumulative and shall be in addition to every other remedy given hereunder or now or hereafter existing at law or in equity or by statute. Every power or remedy given by any of the Financing Documents to Mortgagee or to which it may otherwise be entitled, may be exercised, concurrently or independently, from time to time and as often as may be deemed expedient by Mortgagee. In no event shall Mortgagee, in the exercise of the remedies provided in this Mortgage (including, without limitation, in connection with the assignment of Rents to Mortgagee, or the appointment of a receiver and the entry of such receiver on to all or any part of

the Mortgaged Property), be deemed a "mortgagee in possession," and Mortgagee shall not in any way be made liable for any act, either of commission or omission, in connection with the exercise of such remedies.

27. Multiple Security. If (a) the Premises shall consist of one or more parcels, whether or not contiguous and whether or not located in the same county, or (b) in addition to this Mortgage, Mortgagee shall now or hereafter hold one or more additional mortgages, liens, deeds of trust or other security (directly or indirectly) for the Obligations upon other property in the State in which the Premises are located (whether or not such property is owned by Mortgagor or by others) or (c) both the circumstances described in clauses (a) and (b) shall be true, then to the fullest extent permitted by law, Mortgagee (acting at the written direction of the Required Holders) may commence or consolidate in a single foreclosure action all foreclosure proceedings against all such collateral securing the Obligations (including the Mortgaged Property), which action may be brought or consolidated in the courts of any county in which any of such collateral is located. Mortgagor acknowledges that the right to maintain a consolidated foreclosure action is a specific inducement to Mortgagee to enter into the Collateral Agency Agreement, and Mortgagor expressly and irrevocably waives any objections to the commencement or consolidation of the foreclosure proceedings in a single action and any objections to the laying of venue or based on the grounds of forum non conveniens which it may now or hereafter have. Mortgagor further agrees that if Mortgagee shall be prosecuting one or more foreclosure or other proceedings against a portion of the Mortgaged Property or against any collateral other than the Mortgaged Property, which collateral directly or indirectly secures the Obligations, or if Mortgagee shall have obtained a judgment of foreclosure and sale or similar judgment against such collateral, then, whether or not such proceedings are being maintained or judgments were obtained in or outside the State in which the Premises are located, Mortgagee (acting at the written direction of the Required Holders) may commence or continue foreclosure proceedings and exercise its other remedies granted in this Mortgage against all or any part of the Mortgaged Property and Mortgagor waives any objections to the commencement or continuation of a foreclosure of this Mortgage or exercise of any other remedies hereunder based on such other proceedings or judgments, and waives any right to seek to dismiss, stay, remove, transfer or consolidate either any action under this Mortgage or such other proceedings on such basis. Neither the commencement nor continuation of proceedings to foreclose this Mortgage nor the exercise of any other rights hereunder nor the recovery of any judgment by Mortgagee in any such proceedings shall prejudice, limit or preclude Mortgagee's right to commence or continue one or more foreclosure or other proceedings or obtain a judgment against any other collateral (either in or outside the State in which the Premises are located) which directly or indirectly secures the Obligations, and Mortgagor expressly waives any objections to the commencement of, continuation of, or entry of a judgment in such other proceedings or exercise of any remedies in such proceedings based upon any action or judgment connected to this Mortgage, and Mortgagor also waives any right to seek to dismiss, stay, remove, transfer or consolidate either such other proceedings or any action under this Mortgage on such basis. It is expressly understood and agreed that to the fullest extent permitted by law, Mortgagee (acting at the written direction of the Required Holders) may cause the sale of all collateral which is the subject of a single foreclosure action at either a single sale or at multiple sales conducted simultaneously and take such other measures as are appropriate in order to effect the agreement

of the parties to dispose of and administer all collateral securing the Obligations (directly or indirectly) in the most economical and least time-consuming manner.

28. Successors and Assigns. All covenants of Mortgagor contained in this Mortgage are imposed solely and exclusively for the benefit of Mortgagee and the Secured Parties and their successors and assigns, and no other person or entity shall have standing to require compliance with such covenants or be deemed, under any circumstances, to be a beneficiary of such covenants, any or all of which may be freely waived in whole or in part by Mortgagee (acting at the written direction of the Required Holders) at any time if in the Required Holders' sole discretion it deems such waiver advisable. All such covenants of Mortgagor shall run with the land and bind Mortgagor, the successors and assigns of Mortgagor (and each of them) and all subsequent owners, encumbrancers and tenants of the Mortgaged Property, and shall inure to the benefit of Mortgagee, its successors and assigns until all of the Obligations shall have been paid or satisfied in full and this Mortgage shall have been discharged. The word "Mortgagor" shall be construed as if it read "Mortgagors" whenever the sense of this Mortgage so requires and if there shall be more than one Mortgagor, the obligations of the Mortgagors shall be joint and several.

29. No Waivers, etc. Any failure by Mortgagee to insist upon the strict performance by Mortgagor of any of the terms and provisions of this Mortgage shall not be deemed to be a waiver of any of the terms and provisions hereof, and Mortgagee, notwithstanding any such failure, shall have the right thereafter to insist upon the strict performance by Mortgagor of any and all of the terms and provisions of this Mortgage to be performed by Mortgagor. Mortgagee (acting at the written direction of the Required Holders) may release, regardless of consideration and without the necessity for any notice to or consent by the holder of any subordinate lien on the Mortgaged Property, any part of the security held for the obligations secured by this Mortgage without, as to the remainder of the security, in any way impairing or affecting the lien of this Mortgage or the priority of such lien over any subordinate lien.

30. Governing Law, Etc. This Mortgage shall be governed by and construed in accordance with the laws of the State of Maine, except that Mortgagor expressly acknowledges that by their terms the Note Purchase Agreement, the Notes, and the other Financing Documents shall be construed in accordance with the laws of the State of New York, without regard to principles of conflicts of law, and for purposes of consistency, Mortgagor agrees that in any in personam proceeding related to this Mortgage the rights of the parties to this Mortgage shall also be governed by and construed in accordance with the laws of the State of New York governing contracts made and to be performed in that state, without regard to principles of conflicts of law.

31. Certain Definitions. Unless the context clearly indicates a contrary intent or unless otherwise specifically provided herein, words used in this Mortgage shall be used interchangeably in singular or plural form and the word "Mortgagor" shall mean "each Mortgagor or any subsequent owner or owners of the Mortgaged Property or any part thereof or interest therein," the word "Mortgagee" shall mean "Mortgagee or any successor agent for the Secured Parties," the word "person" shall include any individual, corporation, partnership, trust,

limited liability company, unincorporated association, government, governmental authority, or other entity, and the words "Mortgaged Property" shall include any portion of the Mortgaged Property or interest therein. Whenever the context may require, any pronouns used herein shall include the corresponding masculine, feminine or neuter forms, and the singular form of nouns and pronouns shall include the plural and vice versa. The captions in this Mortgage are for convenience or reference only and in no way limit or amplify the provisions hereof.

32. Release. Upon the sale of any portion of the Mortgaged Property pursuant to the provisions of Section 9.15 of the Note Purchase Agreement, the lien of this Mortgage shall be released from the applicable portion of the Mortgaged Property. Mortgagee (acting at the written direction of the Required Holders) shall execute any documents reasonably requested in writing by Mortgagor to accomplish any release contemplated by this Section (any such release to be without recourse, representation or warranty) and Mortgagor will pay all costs and expenses, including reasonable attorneys' fees, disbursements and other charges, incurred by Mortgagee in connection with the preparation and execution of such documents.

33. State Specific Provisions.

(a) Applicability of Maine Law. Notwithstanding anything else contained herein to the contrary, where provisions contained in this Section 33 conflict with other provisions of this Mortgage, these provisions shall control to the extent necessary to establish, perfect, and maintain a mortgage and an enforceable security interest in the Mortgaged Property.

(b) Statutory Condition. This Mortgage is given upon the STATUTORY CONDITION, which is incorporated herein by reference. To the extent that the provisions of this Mortgage and the provisions set forth in the Statutory Condition conflict, the provisions of this Mortgage shall control to the extent permitted by applicable law.

(c) Statutory Power of Sale. If any Event of Default shall occur and be continuing, the Mortgagee shall have the right to foreclose this Mortgage under any legal method of foreclosure in existence at the time or now existing, or under any other applicable law, including, without limitation, the STATUTORY POWER OF SALE, as set forth in 33 M.R.S.A. Section 501-A and 14 M.R.S.A. Section 6203-A, as each may be amended, which is expressly incorporated herein by reference, to the extent authorized or allowed by any present or future law of the State of Maine. In connection therewith, Mortgagor acknowledges that this Mortgage secures a loan or loans for business and commercial purposes and that this Mortgage is given primarily for a business, commercial or agricultural purpose.

(d) Non-Waiver. Mortgagor agrees for itself, its successors and assigns, that the acceptance, before the expiration of the right of redemption and after the commencement of foreclosure proceedings of this Mortgage, of insurance proceeds, eminent domain awards, rents or anything else of value to be applied on or to the Obligations by the Mortgagee, the Secured Parties or any person or party holding under the Mortgagee shall not constitute a waiver of such foreclosure by the Mortgagee or waiver of the failure of performance by the Mortgagor of any covenants or agreements contained herein, in the other Financing Documents, or in the Note Purchase Agreement. This agreement by Mortgagor shall be that agreement referred to in 14

M.R.S.A. §6321, as amended, as necessary to prevent such waiver of foreclosure. This agreement by Mortgagor is intended to apply to the acceptance and such applications of any such insurance proceeds, eminent domain awards, rents and other sums or anything else of value, whether the same shall be accepted from, or for the account of, the Mortgagor from any other sources whatsoever by the Mortgagee, the Secured Parties or by any person or party holding under the Mortgagee at any time or times in the future while any portion of the Obligations shall remain outstanding.

34. Open-End Mortgage; Limitations. This Mortgage is an open-end mortgage and the Obligations secured hereby include existing indebtedness, "Contingent Obligations," "Future Advances" and "Protective Advances" as such terms are defined in 33 M.R.S.A. § 505, as amended (herein called the "**Open-End Mortgage Statute**"). The maximum aggregate amount of all debts or obligations secured by this Mortgage, individually and collectively, including Contingent Obligations and Future Advances, but excluding Protective Advances, shall not at any time exceed the total amount of Six Hundred Eighty Million Dollars ($680,000,000.00). As stated in this Mortgage, the Obligations include both obligations existing on the date hereof and obligations that may arise in the future. Pursuant to Maine's Open-End Mortgage Statute, to the extent the Obligations may be Contingent Obligations, the maximum amount of such Contingent Obligations shall not at any time exceed $255,000,000, and the maximum amount of any Future Advances, shall not at any time exceed $255,000,000; *provided, further*, that nothing herein contained shall limit the amount secured by this Mortgage if such amount is increased by Protective Advances. All of the Obligations that are Future Advances, Contingent Obligations or Protective Advances shall be secured by this Mortgage with the record priority set forth in the Open-End Mortgage Statute. The maximum amounts set forth above shall only pertain to the record priority of the amount secured hereby pursuant to the Open-End Mortgage Statute and shall not otherwise limit the amount of total obligations of Mortgagor, secured hereby or limit the liability of Mortgagor, to the Mortgagee, or any Secured Parties for such Obligations.

**UNDER MAINE LAW, A BORROWER MAY NOT MAINTAIN AN ACTION UPON ANY AGREEMENT TO LEND MONEY, EXTEND CREDIT, FORBEAR FROM COLLECTION OF A DEBT OR MAKE ANY OTHER ACCOMMODATION FOR REPAYMENT OF A DEBT FOR MORE THAN $250,000.00 UNLESS THE PROMISE, CONTRACT OR AGREEMENT ON WHICH THE ACTION IS BROUGHT OR SOME MEMORANDUM OR NOTE OF THE PROMISE, CONTRACT OR AGREEMENT ON WHICH THE ACTION IS BROUGHT IS BOTH: (1) IN WRITING; AND (2) SIGNED BY THE LENDER.**

35. Waiver of Jury Trial. THE PARTIES HERETO AGREE TO WAIVE THEIR RESPECTIVE RIGHTS TO A JURY TRIAL OF ANY CLAIM OR CAUSE OF ACTION BASED UPON OR ARISING OUT OF THIS MORTGAGE, ANY OTHER FINANCING DOCUMENT, OR ANY DEALINGS BETWEEN THEM RELATING TO THE SUBJECT MATTER OF THIS TRANSACTION. THE SCOPE OF THIS WAIVER IS INTENDED TO BE ALL-ENCOMPASSING OF ANY AND ALL DISPUTES THAT MAY BE FILED IN ANY COURT AND THAT RELATE TO THE SUBJECT MATTER OF THIS TRANSACTION. EACH PARTY HERETO ACKNOWLEDGES THAT THIS WAIVER IS A

MATERIAL INDUCEMENT TO ENTER INTO THIS BUSINESS RELATIONSHIP, THAT IT HAS ALREADY RELIED ON THE WAIVER IN ENTERING INTO THIS MORTGAGE, AND THAT IT WILL CONTINUE TO RELY ON THE WAIVER IN ITS RELATED FUTURE DEALINGS. EACH PARTY HERETO FURTHER WARRANTS AND REPRESENTS THAT IT HAS REVIEWED THIS WAIVER WITH ITS LEGAL COUNSEL, AND THAT IT KNOWINGLY AND VOLUNTARILY WAIVES ITS JURY TRIAL RIGHTS FOLLOWING CONSULTATION WITH LEGAL COUNSEL. IN THE EVENT OF LITIGATION, THIS MORTGAGE MAY BE FILED AS A WRITTEN CONSENT TO A TRIAL BY THE COURT

36. Protections Afforded to the Mortgagee. The Mortgagor hereby agrees that the Mortgagee shall be afforded all of the rights, protections, immunities, indemnities and privileges afforded to the Collateral Agent under the Collateral Agency Agreement.

[Balance of page intentionally blank. Signature pages and acknowledgments follow.]

This Mortgage has been duly executed by Mortgagor on January 25, 2022, and is intended to be effective as of January 31, 2022.

SIGNED, SEALED & DELIVERED
In the presence of:

Witness

GREAT LAKES HYDRO AMERICA, LLC

By: _____
Name: Michael Tebbutt
Title: Chief Financial Officer & Treasurer

STATE OF NEW YORK

COUNTY OF New York, ss.

January 25, 2022

Then personally appeared the above-named Michael Tebbutt, the duly authorized Chief Financial Officer and Treasurer of Great Lakes Hydro America, LLC, a Delaware limited liability company, and acknowledged the foregoing instrument to be his/her free act and deed in his/her capacity and the free act and deed of the said limited liability company.

Notary Public
My commission expires: August 4, 2022

(SEAL)

TRACEY DONELSON
Notary Public, State of New York
No. 01DO6309006
Qualified in Nassau County
My Comm. Expires August 04, 2022

(GLHA Maine Mortgage)

Acceptance of this Mortgage by the Collateral Agent:

Accepted. The Bank of New York Mellon Trust Company, N.A., as Collateral Agent as aforesaid

By: _____
Name: Wayne E. Edmiston, Jr.
Title: Vice President

**[Execute in black or dark blue ink]**

STATE OF FLORIDA
COUNTY OF Duval

The foregoing instrument was acknowledged before me this 25th day of January, 2022, by Wayne E. Edmiston, Jr. Vice President of The Bank of New York Mellon Trust Company, N.A., a national banking association, as Collateral Agent.

Notary Public State of Florida
Stephanie Greene-Matthews
My Commission HH 136822
Expires 06/05/2025

Stephanie Greene-Matthews
Notary Public

My commission expires: 6/5/2025

(SEAL)

(GLHA Maine Mortgage)

Schedule A

**To Mortgage, Fixture Filing, Assignment of Rents and Leases and Security Agreement from Great Lakes Hydro America, LLC, as Mortgagor, to The Bank of New York Mellon Trust Company, N.A., as Collateral Agent, as Mortgagee, dated as of January 31, 2022**

**This Schedule A is comprised of two sections; Section I and Section II which together describe the Real Estate and Appurtenances**

**SECTION I**

I. PENOBSCOT MILLS PROJECT - FERC PROJECT #2458

The land and interests in land, and the improvements thereon, including, without limitation, the hydroelectric generating facilities and storage projects on the Penobscot River in Maine, comprising FERC Project #2458, including dams, impoundments, substations, dikes, boat launches and other related and appurtenant facilities depicted on the following plans, or any amendments thereto, on file with the Federal Energy Regulatory Commission (collectively the "Penobscot Mills Project Plans"):

1. Exhibit G-1 Sheet 1 of 10, Penobscot Mills Project, Project Area Map, FERC No. 2458-1056

2. Exhibit G-2, Sheet 2 of 10 Penobscot Mills Project, Project Boundary Map, North Twin Development, FERC No. 2458- 1071.

3. Exhibit G-3, Sheet 3 of 10 Penobscot Mills Project, Project Boundary Map, Millinocket Lake Storage Development, FERC No. 2458-1072

4. Exhibit G-4, Sheet 4 of 10 Penobscot Mills Project, Project Boundary Map, Lower Project Developments, FERC No. 2458- 1073

5. Exhibit G-5, Sheet 5 of 10 Penobscot Mills Project, Millinocket Development, Project Boundary Detail Sheet, FERC No. 2458-1074

6. Exhibit G-6, Sheet 6 of 10 Penobscot Mills Project, Dolby and East Millinocket Developments, Project Boundary Detail Sheet, FERC No. 2458-1075

7. Exhibit G-7, Sheet 7 of 10 Penobscot Mills Project, North Twin Development, Project Boundary Detail Sheet, FERC No. 2458-1076

8. Exhibit G-8, Sheet 8 of 10 Penobscot Mills Project, Millinocket Development, Ferguson Pond Detail Sheets, FERC No. 2458-1077

9. Exhibit G-9, Sheet 9 of 10 Penobscot Mills Project, East Millinocket Development, Millinocket Lake Storage Development, Project Boundary Detail Sheet, FERC No. 2458-1078

10. Exhibit G-10, Sheet 10 of 10, Penobscot Mills Project, Miscellaneous Project Boundary Details, FERC No. 2458-1079 All of which are further described as follows:

A. North Twin - FERC #2458 1. Project Works-land area

The land and interests in land and the improvements thereon, including, without limitation, North Twin dam, intake structure, spillway, six auxiliary dikes around the perimeter of the reservoir, ice/trash sluice, transmission line, upstream wood fish passageway (no longer used), penstock, powerhouse, walls, racks, gates, substation, boat launch, flowage area and other related improvements (collectively, the "Project Works"), in Township 3 Indian Junction, County of Penobscot, State of Maine, and other related improvements depicted on the following plans (collectively the "Survey"):

Plan of Plisga & Day, Land Surveyors entitled "North Twin Dam & Transmission Line, North Twin Lake

to Millinocket Great Northern Paper Company, TWP 3 Indian Purchase & Millinocket, Maine for Great Lakes Hydro America, LLC, consisting of 4 Sheets.

Note: This plan depicts substation, transmission line, dam (3.2.1 North Twin Dam parcel) and related facilities.

2. Flowage Rights/Easements

Rights, whether in fee or easement, to flow land up to the normal full pond level by the operation of the North Twin Dam at the impoundment created by the North Twin Dam, which includes a portion of North Twin Lake aka Elbow Lake, as further shown on the Penobscot Mills Project Plans.

3. Project Lands

All real estate located within the Project Boundary shown on the Penobscot Mills Project Plans and to the extent further described in this Schedule A the lands adjacent thereto.

4. Access Roads to Project Works

Pedestrian and vehicular rights to cross the private roads and ways, as historically used, leading from the Project Works to the public roads, including the appurtenant easements described in this Schedule A.

B. Millinocket - FERC #2458 1. Project Works-land area

The land and interests in land and the improvements thereon, including, without limitation, Millinocket Lake dam, intake structure, spillway, six auxiliary dikes around the perimeter of the reservoir, ice/trash sluice, transmission line, upstream wood fish passageway (no longer used), penstock, powerhouse, walls, racks, gates, substation, boat launch, flowage area and other related improvements (collectively, the "Project Works"), in Township 1, Range 8 WELS, County of Penobscot, State of Maine, and other related improvements depicted on the following plans (collectively the "Survey"):

i. Plan of Plisga & Day, Land Surveyors entitled "Boundary Survey Plan of Easement Area 4, Easement Area 2, Substation 4 & 2-3 Easements, The Frequency Converter Parcel & The T-33 Parcel on Land of Katahdin Paper Company, Millinocket, Maine for Great Lakes Hydro America, LLC", dated January 28, 2002, last revised August 23, 2004, Sheet 3 of 15 (3.10.5 Substation No. 4 Parcel, 3.10.6 Frequency Converter Parcel, 3.10.7 Substation No. 2-3 Parcel, 3.10.8 T33 Transformer Parcel, 4.4.2 Transmission Line Easement Area 2, 4.4.4 Stone Dam Transmission Line Easement-Easement Area 4);

ii. Plan of Plisga & Day, Land Surveyors entitled "Boundary Survey Plan of Easement Area 5 on Land of Katahdin Paper Company, Millinocket, Maine for Great Lakes Hydro America, LLC", dated January 28, 2002, last revised August 23, 2004, Sheet 15 of 15 (3.10.9 Penstock Easement);

iii. Plan of Plisga & Day, Land Surveyors entitled "Survey Plan of the Millinocket Mill Site, Millinocket, Maine, Katahdin Paper Company", consisting of 2 sheets (3.4 Ferguson Canal, 3.10.2 Little Italy Substation, portion of 3.10.5 Substation No. 4 Parcel and 3.10.3 Power Station);

iv. Plan of Bridgham Engineering and Land Surveying entitled "Survey Plat Penobscot Mills Pumping Station Ambejejus & Millinocket Lakes, T1 R9 WELS" dated November 24, 1999, last revised August 24, 2004, consisting of 1 sheet (3.7 Penobscot Mills Pumping Station);

v. Plan of Plisga & Day, Land Surveyors entitled "Survey Plan Stone Dam, Ferguson Lake & Quakish Lake Dikes, Millinocket, T3 Indian Purchase for Great Northern Paper, Inc.", dated September 6, 2001, last revised August 24, 2004, consisting of 2 sheets (3.3 Stone Dam (Quakish Lake Dam), Quakish and Ferguson Lake Dikes); and

vi. Plan of Bridgham Engineering and Lane Surveying entitled "Survey Plat Millinocket Lake Dam Lot, T1 R8 WELS, dated October 8, 1999, last revised August 14, 2004, consisting of 1 sheet (3.8 Millinocket Lake Dam).

2. Flowage Rights/Easements

Rights, whether in fee or easement, to flow land up to the normal full pond level by the operation of the Millinocket Lake Dam, Millinocket Mill Dam, and Stone Dam at the impoundments created by the aforesaid dams, which includes portions of Millinocket Lake, Ferguson Pond, and Quakish Lake as further shown on the Penobscot Mills Project Plans.

3. Project Lands

All real estate located within the Project Boundary shown on the Penobscot Mills Project Plans and to the extent further described in this Schedule A the lands adjacent thereto, and the Central Street Woodlands Office described in this Schedule A (3.11 Millinocket (Central Street Woodlands Office).

4. Access Roads to Project Works

Pedestrian and vehicular rights to cross the private roads and ways, as historically used, leading from the Project Works to the public roads, including the appurtenant easements described in this Schedule A.

C. Dolby - FERC #2458

1. Project Works-land area

The land and interests in land and the improvements thereon, including, without limitation, Dolby Dam, intake structure, spillway, six auxiliary dikes around the perimeter of the reservoir, ice/trash sluice, transmission line, upstream wood fish passageway (no longer used), penstock, powerhouse, walls, racks, gates, substation, boat launch, flowage area and other related improvements (collectively, the "Project Works"), in the Town of East Millinocket and Township A, Range 7 WELS, County of Penobscot, State of Maine, and other related improvements depicted on the following plans (collectively the "Survey"):

i. Plan of Plisga & Day, Land Surveyors entitled "Boundary Survey Plan Lands of Katahdin Paper Company, TA R7, WELS & East Millinocket, Maine for Great Lakes Hydro America, LLC" dated January 28, 2002; updated August 23, 2004, consisting of 1 Sheet (3.14.1 Mill Dam Parcel).
ii. Plan of Plisga & Day, Land Surveyors entitled "Survey Plan of the Dolby Dam Sites, East Millinocket & TA R7, WELS for Great Lakes Hydro America, LLC" dated September 7, 2001; updated August 23, 2004, consisting of 3 Sheets (3.14.1 Mill Dam Parcel).
iii. Plan of Plisga & Day, Land Surveyors entitled "Survey Plan of the Dolby Pond Boat Launch, Route 11 & 157, Millinocket, Maine for Great Lakes Hydro America, LLC dated September 4, 2001, updated August 23, 2004, consisting of 1 sheet (3.17 Dolby Boat Launch).
iv. Plan of Plisga & Day, Land Surveyors entitled "Boundary Survey Plan of Transmission Line easement & Sub- Station easement on land of Maine Timberlands Company TA R7, Medway & T2 R9 NWP for Great lakes Hydro America, LLC, Sheet 2 of 4 (3.14.2 New Substation).

2. Flowage Rights/Easements

Rights, whether in fee or easement, to flow land up to the normal full pond level by the operation of the Dolby Dam at the impoundment created by the Dolby Dam, which includes a portion of Dolby Pond, as further shown on the Penobscot Mills Project Plans.

3. Project Lands

All real estate located within the Project Boundary shown on the Penobscot Mills Project Plans and to the extent further described in this Schedule A the lands adjacent thereto.

4. Access Roads to Project Works

Pedestrian and vehicular rights to cross the private roads and ways, as historically used, leading from

the Project Works to the public roads, including the appurtenant easements described in this Schedule A.

D. East Millinocket - FERC #2458 1. Project Works-land area

The land and interests in land and the improvements thereon, including, without limitation, East Millinocket Dam, intake structure, spillway, six auxiliary dikes around the perimeter of the reservoir, ice/trash sluice, transmission line, upstream wood fish passageway (no longer used), penstock, powerhouse, walls, racks, gates, substation, boat launch, flowage area and other related improvements (collectively, the "Project Works"), in Town of East Millinocket, County of Penobscot, State of Maine, and other related improvements depicted on the following plans (collectively the "Survey"):

a. Plan of Plisga & Day, Land Surveyors entitled "Boundary Survey Plan - a portion of the Dam Site on lands of Katahdin Paper Company, East Millinocket, Maine for Great Lakes Hydro America, LLC" dated January 28, 2002; updated August 23, 2004, consisting of 7 Sheets.

i. Sheet 2 depicts North side of dam (3.13.1 East Millinocket Dam)
ii. Sheet 6 depicts Electrical Substation 3 (3.13.3 Electric Substation 3)
iii. Sheet 7 depicts Electrical Substation 3 (3.13.2 Electric Substation 1)

b. "Survey Plan of the Dolby Dam Sites East Millinocket 7 TA R7 WELS for Great Lakes Hydro America, LLC" prepared by Plisga & Day dated 9/7/2001, updated 8/23/2004, consisting of 3 sheets (south side of dam included in within 3.14.1 Mill Dam)

c. Plan of Plisga & Day, Land Surveyors entitled "Boundary Survey Plan of Transmission Line easement & Sub-Station easement on land of Maine Timberlands Company TA R7, Medway & T2 R9 NWP for Great lakes Hydro America, LLC, Sheet 2 of 4 (3.14.2 New Substation).

2. Flowage Rights/Easements

Rights, whether in fee or easement, to flow land up to the normal full pond level by the operation of the East Millinocket Dam at the impoundment created by the East Millinocket Dam, which includes a portion of West Branch of Penobscot River, as further shown on the Penobscot Mills Project Plans.

3. Project Lands

All real estate located within the Project Boundary shown on the Penobscot Mills

Project Plans and to the extent further described in this Schedule A the lands adjacent thereto.

4. Access Roads to Project Works

Pedestrian and vehicular rights to cross the private roads and ways, as historically used, leading from the Project Works to the public roads, including the appurtenant easements described in this Schedule A.

II. RIPOGENUS/MCKAY - FERC PROJECT #2572

The land and interests in land and the improvements thereon, including, without limitation, the hydroelectric generating facilities and storage projects on Ripogenus Lake in Maine, comprising FERC Project #2572, including dams, impoundments, intake structure, tunnel, and penstocks, powerhouse, tailrace, 115k kV substation, transmission line, surge tank, pumping house, boat launches and other related and appurtenant facilities depicted on the following plans, or any amendments thereto, on file with the Federal Energy Regulatory Commission (collectively the "Ripogenus/Mckay Project Plans"):

1. Exhibit G-1 Sheet 1 of 3, Ripogenus Project, Project Area Map, Great Northern Paper, Inc., Millinocket, Maine, FERC No. 2572-1019.

2. Exhibit G-1 Sheet 2 of 3, Ripogenus Project, Project Boundary Detail Map, Project Structures, Great Northern Paper, Inc., Millinocket, Maine, FERC No. 2572-1015.

3. Exhibit G-1 Sheet 3 of 3, Ripogenus Project, Project Boundary Detail Map, Transmission Line, Great Northern Paper, Inc., Millinocket, Maine, FERC No. 2572-1018.

1. Project Works-land area:

The land and interests in land and the improvements thereon, including, without limitation, the Ripogenus dam, McKay Station, impoundments, intake structure, tunnel, and penstocks, powerhouse, tailrace, 115k kV substation, transmission line, surge tank, pumping house and other related improvements (collectively, the "Project Works"), in Township T3, Range 11 WELS, County of Piscataquis, State of Maine, depicted on the following plans (collectively the "Survey"):

i. Plan by Bridgham Engineering and Land Surveying entitled "Survey Plat Ripogenus Project T3 R11 WELS" dated September 4, 2001; revised August 19, 2004, consisting of 1 sheet (2.19 Ripogenus Dam Lot and McKay Station)

ii. Plan by Bridgham Engineering and Land Surveying entitled "Survey Plat, Umbazooksus Lake, T6 R13" dated September 4, 2001, revised January 12, 2005, consisting of 1 sheet (2.4 Umbazooksus Lake).

2. Flowage Rights/Easements

Rights, whether in fee or easement, to flow land up to the normal full pond level by the operation of the Ripogenus Dam at the impoundment created by the Ripogenus Dam, as further shown on the Ripogenus/Mckay Project Plans.

3. Project Lands

All real estate located within the Project Boundary shown on the Ripogenus/Mckay Project Plans and to the extent further described in this Schedule A the lands adjacent thereto.

4. Access Roads to Project Works

Pedestrian and vehicular rights to cross the private roads and ways, as historically used, leading from the Project Works to the public roads, including the appurtenant easements described in this Schedule A.

III. MATTACEUNK/WELDON - FERC PROJECT #2520

The land and interests in land and the improvements thereon, including, without limitation, the hydroelectric generating facilities and storage projects on the Penobscot River in Maine, comprising FERC Project #2520, including a dam, impoundment, reservoir, powerhouse, tailrace, rollgate, turbine generators, 6.9kV generator leads, transformer banks, a nine-mile long, 34kV, 40 Hertz transmission line, canoe portage, and other related and appurtenant facilities depicted on the following plans, or any amendments thereto, on file with the Federal Energy Regulatory Commission (collectively the "Mattaceunk/Weldon Project Plans"):

1. Exhibit G, Sheet 1 of 7, Map of Drainage Area of the Power System of Great Northern Paper Co., Great Northern Nekoosa Corp., Millinocket, Maine, FERC No. 2520-9.

2. Exhibit G, Sheet 2 of 7, General Map of Power System, Ripogenus Project, Penobscot Mills Project, Mattaceunk Project, Great Northern Nekoosa Corp., Millinocket, Maine, FERC No. 2520-10.

3. Exhibit G, Sheet 3 of 7, General Map of Power System, Ripogenus Project, Penobscot Mills Project, Mattaceunk Project, Great Northern Nekoosa Corp, Millinocket, Maine, FERC No. 2520-11.

4. Exhibit G, Sheet 4 of 7, General Map of Dam and Flowage Area, The Mattaceunk, Project, Mattawamkeag, Maine, Great Northern Nekoosa Corp, Millinocket, Maine, FERC No. 2520-12.

5. Exhibit G, Sheet 5 of 7, Detail Map of Dam and Flowage Area, The Mattaceunk Project, Mattawamkeag, Maine, Great Northern Nekoosa Corp., Millinocket, Maine, FERC No. 2520-13.

6. Exhibit G, Sheet 6 of 7, One Line Diagram of the Power System of the Great Northern Paper Co., Great Northern Nekoosa Corp., Millinocket, Maine, FERC No. 2520-14.

7. Exhibit G, Sheet 7 of 7, Map of Power Transmission Line, The Mattaceunk Project, Mattawamkeag, Maine, Great Northern Nekoosa Corp., Millinocket, Maine, FERC No. 2520-15.

1. Project Works-land area:

The land and interests in land and the improvements thereon, including, without limitation, the Mattaceunk/Weldon dam, impoundment, reservoir, powerhouse, turbine generators, 6.9kV generator leads, transformer banks, a nine-mile long, 34kV, 40 Hertz transmission line, canoe portage and other related improvements (collectively, the "Project Works"), in the Towns of Mattawamkeag and Woodville, County of Penobscot, State of Maine, depicted on the following plans (collectively the "Survey").

i. Plan by Plisga & Day Land Surveyors entitled "Survey Plan of the Mattaceunk Dam Site Weldon Station, State Route 157, Mattawamkeag & Woodville, Maine for Great Lakes Hydro America, LLC." dated September 6, 2001; revised August 23, 2004 (3.15.1 Mattaceunk Dam Parcel).

2. Flowage Rights/Easements

Rights, whether in fee or easement, to flow land up to the normal full pond level by the operation of the Mattaceunk Dam at the impoundment created by the Mattaceunk Dam, as further shown on the Mattaceunk/Weldon Project Plans.

3. Project Lands

All real estate located within the Project Boundary shown on the Mattaceunk/Weldon Project Plans and to the extent further described in this Schedule A the lands adjacent thereto.

4. Access Road to Project Works

Pedestrian and vehicular rights to cross the private roads and ways, as historically used, leading from the Project Works to the public roads, including the appurtenant easements described in this Schedule A.

IV. PENOBSCOT RIVER STORAGE PROJECTS - FERC PROJECT #2634

The land and interests in land and the improvements thereon, including, without limitation, the nine (9) storage developments, their associated dams, impoundments and storage reservoirs known as Canada Falls, Seboomook, Caucomgomoc, Ragged Lake, Dole Pond, Long Pond, Penobscot, Harrington Lake, and Loon Lake and all their related appurtenant facilities depicted on the following plans, or any amendments thereto, on file with FERC (collectively, the "Penobscot River Project Plans"):

1. Exhibit G-1, Sheet 1 of 11, Storage Project, Map of Regional Area, FERC No. 2634-1024.

2. Exhibit G-1, Sheet 2 of 11, Storage Project, Map of Project Area, FERC No. 2634-1025.

3. Exhibit G-1, Sheet 3 of 11, Storage Project, Map of Canada Falls Project Area, FERC No. 2634-1026.

4. Exhibit G-1, Sheet 4 of 11, Storage Project, Map of Seboomook Project Area, FERC No. 2634-1027.

5. Exhibit G-1, Sheet 5 of 11, Storage Project, Map of Caucomgomoc Project Area, FERC No. 2634-1028.

6. Exhibit G-1, Sheet 6 of 11, Storage Project, Map of Ragged Lake Project Area, FERC No. 2634-1029.

7. Exhibit G-1, Sheet 7 of 11, Storage Project, Map of Dole Pond Project Area, FERC No. 2634-1030.

8. Exhibit G-1, Sheet 8 of 11, Storage Project, Map of Long Pond Storage Area, FERC No. 2634-1031.

9. Exhibit G-1, Sheet 9 of 11, Storage Project, Map of Penobscot Lake Project, FERC No. 2634-1032

10. Exhibit G-1, Sheet 10 of 11, Storage Project, Map of Harrington Lake Project Area, FERC No.. 2634-1033

11. Exhibit G-1, Sheet 11 of 11, Storage Project, Map of Loon Lake Project Area, FERC No. 2634-1034

A. CANADA FALLS

1. Project Works-land area

The land and interests in land and the improvements thereon, including, without limitation, the Canada Falls Lake dam, including any spillways, gates, sluices, fish ways and all related improvements (collectively, the "Project Works"), in the Township of Pittston Academy Grant, County of Somerset, State of Maine, as are depicted on the following plans (collectively, the "Survey") and on the applicable Penobscot River Project Plans:

i. Plan by Bridgham Engineering and Land Surveying entitled "Survey Plat Canada Falls Lake Dam Lot Part of Pittston Academy Grant (Township 2 Range 4 NBKP)" dated May 17, 1999; revised July 19, 2004 (1.1 Canada Falls) (Job No. 2809).

2. Flowage Rights/Easements

Rights, whether in fee or easement, to flow land up to normal full pond level by the operation of the Canada Falls Dam, which includes a portion of the South Branch of the Penobscot River, as is further shown on the Penobscot River Project Plans.

3. Project Lands

All real estate located within the Project Boundary shown on the Penobscot River Project Plans and to the extent further described in this Schedule A, the lands adjacent thereto.

4. Access to Project Works

Pedestrian and vehicular rights to cross the private roads and ways, as historically used, leading from the Project Works to the public roads, including the appurtenant easements described in this Schedule A, if any.

B. SEBOOMOOK DAM

1. Project Works-land area

The land and interests in land and the improvements thereon, including, without limitation, the Seboomook Dam, including any spillways, gates, sluices, fish ways and all related improvements (the "Project Works") Township of Seboomook (T0 R4 NBKP), County of Somerset, State of Maine, as are depicted on the following plans (collectively, the "Survey") and on the applicable Penobscot River Project Plans:

i. Plan by Bridgham Engineering and Land Surveying entitled "Survey Plat GNP Storage Pond Lot Plan For Seboomook Dam" dated May 17, 1999; revised July 7, 2004 (1.2.1 Seboomook Lake Dam) (Project No. 2810).

ii. Plan by Bridgham Engineering and Land Surveying entitled "Survey Plat Proposed Pittston Boat Launch Site Part of Pittston Academy Grant (Township 2 Range 4 NBKP)" dated May 17, 1999; revised July 7, 2004 (1.2.2 Pittston Boat Launch) (Job No. 2814).

2. Flowage Rights/Easements

Rights, whether in fee or easement, to flow land up to normal full pond level by the operation of the Seboomook Dam, which includes a portion of the South Branch and North Branch of the Penobscot River, as is further shown on the Penobscot River Project Plans.

3. Project Lands

All real estate located within the Project Boundary shown on the Penobscot River Project Plans and to the extent further described in this Schedule A, the lands adjacent thereto.

4. Access to Project Works

Pedestrian and vehicular rights to cross the private roads and ways, as historically used, leading from the Project Works to the public roads, including the appurtenant easements described in this Schedule A, if any.

C. CAUCOMGOMAC

1. Project Works-land area

The land and interests in land and the improvements thereon, including, without limitation, the Caucomgomac Lake dam, including any spillways, gates, sluices, fish ways and all related improvements (collectively, the "Project Works") as are depicted on the following plans (collectively, the "Survey") in Township T6, R15 WELS, County of Piscataquis, State of Maine, and on the applicable Penobscot River Project Plans:

i. Plan by Plisga & Day, Land Surveyors entitled "Survey Plan Caucomgomoc Dam Site TWP T6 R14, WELS, Maine" for Great Lakes Hydro America, LLC" dated September 7, 2001; updated August 23, 2004 (Project No. 01237_S). (2.2 Caucomgomac Dam Lot).

ii. Plan by Bridgham Engineering and Land Surveying entitled "Survey Plat Caucomgomoc Lake Boat Launch Part of T6 R15 WELS" dated August 11, 1999; revised June 14, 2005 (2.1 Caucomgomoc Boat Launch) (Job No. 2812).

2. Flowage Rights/Easements

Rights, whether in fee or easement, to flow land up to normal full pond level by the operation of the Caucomgomac Dam, which includes Rowe Pond, Round Pond and Ciss Stream, as is further shown on the Penobscot River Project Plans.

3. Project Lands

All real estate located within the Project Boundary shown on the Penobscot River Project Plans and to the extent further described in this Schedule A, the lands adjacent thereto.

4. Access to Project Works

Pedestrian and vehicular rights to cross the private roads and ways, as historically used, leading from the Project Works to the public roads, including the appurtenant easements described in this Schedule A, if any.

D. RAGGED LAKE

1. Project Works-land area

The land and interests in land and the improvements thereon, including, without limitation, the Ragged Lake dam, including any spillways, gates, sluices, fish ways and all related improvements (collectively, the "Project Works") in Township T2, R13 WELS, County of Piscataquis, State of Maine, as are depicted on the following plans (collectively, the "Survey") and on the applicable Penobscot River Project Plans:

i. Plan by Bridgham Engineering and Land Surveying entitled "Survey Plat GNP Storage Pond Lot Plan for Ragged Lake Dam" revised August 11, 2004 FERC Project No. 2634 T2 R13 WELS (2.12 Ragged Lake) (Job No. 2811).

2. Flowage Rights/Easements

Rights, whether in fee or easement, to flow land up to normal full pond level by the operation of the Ragged Lake Dam, as is further shown on the Penobscot River Project Plans.

3. Project Lands

All real estate located within the Project Boundary shown on the Penobscot River Project Plans and to the extent further described in this Schedule A, the lands adjacent thereto.

4. Access to Project Works

Pedestrian and vehicular rights to cross the private roads and ways, as historically used, leading from the Project Works to the public roads, including the appurtenant easements described in this Schedule A, if any.

F. DOLE POND

1. Project Works - land area

The land and interests in land and the improvements thereon, including, without limitation, the Dole Pond dam, including any spillways, gates, sluices, fish ways and all related improvements (collectively, the "Project Works") in Township of Dole Brook, T3 R5 NBKP, County of Somerset, State of Maine, as are depicted on the following plans (collectively, the "Survey") and on the applicable Penobscot River Project Plans:

i. Plan by Bridgham Engineering and Land Surveying entitled "Survey Plat Proposed Dole Pond Lot Part of Dole Brook Township T3 R5 NBKP" dated May 17, 1999; updated July 7, 2004 (1.5 Dole Pond Dam) (Job No. 2808).

2. Flowage Rights/Easements

Rights, whether in fee or easement, to flow land up to normal full pond level by the operation of the Dole Pond Dam, as is further shown on the Penobscot River Project Plans.

3. Project Lands

All real estate located within the Project Boundary shown on the Penobscot River Project Plans and to the extent further described in this Schedule A, the lands adjacent thereto.

4. Access to Project Works

Pedestrian and vehicular rights to cross the private roads and ways, as historically used, leading from the Project Works to the public roads, including the appurtenant easements described in this Schedule A, if any.

F. LONG POND

1. Project Works - land area

The land and interests in land and the improvements thereon, including, without limitation, the Long Pond dam, including any spillways, gates, sluices, fish ways and all related improvements (collectively, the "Project Works") in Township T3 R5 NBKP, County of Somerset, State of Maine, as are depicted on the following plans (collectively, the "Survey") and on the applicable Penobscot River Project Plans:

i. Plan by Bridgham Engineering and Land Surveying entitled "Survey Plat Proposed Long Pond Dam Lot Part of Dole Brook Township (Township 3 Range 5 NBKP)" dated May 17, 1999; updated July 7, 2004 (1.3 Long Pond Dam) (Job No. 2806).

2. Flowage Rights/Easements

Rights, whether in fee or easement, to flow land up to normal full pond level by the operation of the Long Pond Dam, as is further shown on the Penobscot River Project Plans.

3. Project Lands

All real estate located within the Project Boundary shown on the Penobscot River Project Plans and to the extent further described in this Schedule A, the lands adjacent thereto.

4. Access to Project Works

Pedestrian and vehicular rights to cross the private roads and ways, as historically used, leading from the Project Works to the public roads, including the appurtenant easements described in this Schedule A, if any.

G. PENOBSCOT

1. Project Works - land area

The land and interests in land and the improvements thereon, including, without limitation, the Penobscot Lake dam, including any spillways, gates, sluices, fish ways and all related improvements (collectively, the "Project Works") in the Township of Prentiss, County of Somerset, State of Maine, as are depicted on the following plans (collectively, the "Survey") and on the applicable Penobscot River Project Plans:

i. Plan by Bridgham Engineering and Land Surveying entitled "Survey Plat Proposed Penobscot Lake Dam Lot Part of Prentiss Township (Township 4 Range 4 NBKP)" dated May 17, 1999; updated July 7, 2004 (1.4 Penobscot Lake) (Job No. 2807).

2. Flowage Rights/Easements

Rights, whether in fee or easement, to flow land up to normal full pond level by the operation of the Penobscot Lake Dam, as is further shown on the Penobscot River Project Plans.

3. Project Lands

All real estate located within the Project Boundary shown on the Penobscot River Project Plans and to the extent further described in this Schedule A, the lands adjacent thereto.

4. Access to Project Works

Pedestrian and vehicular rights to cross the private roads and ways, as historically used, leading from the Project Works to the public roads, including the appurtenant easements described in this Schedule A, if any.

H. HARRINGTON LAKE

1. Project Works - land area

The land and interests in land and the improvements thereon, including, without limitation, Harrington Lake dam, including any spillways, gates, sluices, fish ways and all related improvements (collectively, the "Project Works") in Township 4, Range 11 WELS, County of Piscataquis, State of Maine, as are depicted on the following plans (collectively, the "Survey") and on the applicable Penobscot River Project Plans:

i. Plan by Bridgham Engineering and Land Surveying entitled "Survey Plat Harrington Lake Dam Lot Part of T4 R11 WELS" dated September 4, 2001; revised August 20, 2004 (2.18 Harrington Lake Dam Easement) (Job No. 2857).

ii. Plan by Bridgham Engineering and Land Surveying entitled "Survey Plat Harrington Lake Dam Lot Portion of T3 R11 WELS" dated September 16, 1999; revised October 8, 1999; revised January 29, 2002; revised August 20, 2004 (2.18 Harrington Lake Dam Easement) (Job No. 2857).

2. Flowage Rights/Easements

Rights, whether in fee or easement, to flow land up to normal full pond level by the operation of the Harrington Lake Dam, as is further shown on the Penobscot River Project Plans.

3. Project Lands

All real estate located within the Project Boundary shown on the Penobscot River Project Plans and to the extent further described in this Schedule A, the lands adjacent thereto.

4. Access to Project Works

Pedestrian and vehicular rights to cross the private roads and ways, as historically used, leading from the Project Works to the public roads, including the appurtenant easements described in this Schedule A, if any.

I. LOON LAKE

1. Project Works - land area

The land and interests in land and the improvements thereon, including, without limitation, Loon Lake dam, including any spillways, gates, sluices, fish ways and all related improvements (collectively, the "Project Works") in Township T6 R14 WELS, County of Piscataquis, State of Maine, as are depicted on the following plans (collectively, the "Survey") and on the applicable Penobscot River Project Plans:

i. Plan by Bridgham Engineering and Land Surveying entitled "Survey Plat Loon Lake Dam Lot Part of T6 R15 & T6 R15" dated June 1, 1999; revised July 19, 2004 (2.3 Loon Lake Dam) (Job No. 2813).

2. Flowage Rights/Easements

Rights, whether in fee or easement, to flow land up to normal full pond level by the operation of the Loon Lake Dam, as is further shown on the Penobscot River Project Plans.

3. Project Lands



BK 8888 PG 187

All real estate located within the Project Boundary shown on the Penobscot River Project Plans and to the extent further described in this Schedule A, the lands adjacent thereto.

4. Access to Project Works

Pedestrian and vehicular rights to cross the private roads and ways, as historically used, leading from the Project Works to the public roads, including the appurtenant easements described in this Schedule A, if any.

Transmission Line Easements

Transmission line easements, located upon, over, under, through and across the transmission line easement parcels as more fully described in this Schedule A, including those transmission line easements shown on the applicable Project Plans and the following surveys:

1. Plan of Plisga & Day, Land Surveyors entitled "Transmission Line Survey, Mattaseaunk Dam to East Millinocket for Great Lakes Hydro America, LLC" dated September 7, 2001, updated August 23, 2004, consisting of 7 sheets (4.1 Transmission Line Easement)

2. Plan of Plisga & Day, Land Surveyors entitled "Transmission Line Survey for Great Lakes Hydro America, LLC, Dolby Dam to the Millinocket Mill TA R7 WELS", consisting of 3 sheets (4.2.1 First Easement Parcel, 4.2.2 Second Easement Parcel and

4.3 Transmission Line Easement).

3. Plan of Plisga & Day, Land Surveyors entitled "Boundary Survey Plan of Easement Area 1 and Easement Exception Area A on Land of Katahdin Paper Company, Millinocket, Maine for Great Lakes Hydro America, LLC", dated January 28, 2002, last revised August 23, 2004, Sheet 5 of 15 (4.4.1 Transmission Line Easement Area 1)

4. Plan of Plisga & Day, Land Surveyors entitled "Boundary Survey Plan of Easement Area 1 on Land of Katahdin Paper Company, Millinocket, Maine for Great Lakes Hydro America, LLC", dated January 28, 2002, last revised August 23, 2004, Sheets 6 and 7 of 15 (4.4.1 Transmission Line Easement Area 1)

5. Plan of Plisga & Day, Land Surveyors entitled "Boundary Survey Plan of Easement Area 4, Easement Area 2, Substation 4 & 2-3 Easements, The Frequency Converter Parcel & The T-33 Parcel on Land of Katahdin Paper Company, Millinocket, Maine for Great Lakes Hydro America, LLC", dated January 28, 2002, last revised August 23, 2004, Sheet 3 of 15 (4.4.2 Transmission Line Easement Area 2, 4.4.4 Stone Dam Transmission Line Easement-Easement Area 4)

6. Plan of Plisga & Day, Land Surveyors entitled "Boundary Survey Plan of Easement Area 3 on Land of Katahdin Paper Company, Millinocket, Maine for Great Lakes Hydro America, LLC", dated January 28, 2002, last revised August 23, 2004, Sheet 4 of 15 (4.4.3 Transmission Line Easement Area 3)

7. Plan of Plisga & Day, Land Surveyors entitled "Boundary Survey Plan of Easement Area 4 on Land of Katahdin Paper Company, Millinocket, Maine for Great Lakes Hydro America, LLC", dated January 28, 2002, last revised August 23, 2004, Sheets 1 and 2 of 15 (4.4.4 Stone Dam Transmission Line Easement-Easement Area 4)

8. Plan of Plisga & Day, Land Surveyors entitled "Boundary Survey Plan of Easement Area 6 on Land of Katahdin Paper Company, Millinocket, Maine for Great Lakes Hydro America, LLC", dated January 28, 2002, last revised August 23, 2004, Sheet 14 of 15 (4.4.5 Transmission Line Easement Area 6)

9. Plan of Plisga & Day, Land Surveyors entitled "Boundary Survey Plan of Easement Area 7 on

Land of Katahdin Paper Company, Millinocket, Maine for Great Lakes Hydro America, LLC", dated January 28, 2002, last revised August 23, 2004, Sheets 8-12 of 15 (4.4.6 Transmission Line Easement Area 7)

10. Plan of Plisga & Day, Land Surveyors entitled "Boundary Survey Plan of Transmission Line Easements & Substation Easements on land of Maine Timberlands Company TA R7, Medway and T2 R9 NWP for Great Lakes Hydro America, LLC, consisting of 4 sheets (4.7 Transmission Line Easement)

11. Plan of Plisga & Day, Land Surveyors entitled "North Twin Dam & Transmission Line, North Twin Lake to Millinocket Great Northern Paper Company, TWP 3 Indian Purchase & Millinocket, Maine for Great Lakes Hydro America, LLC, consisting of 4 Sheets.

12. Plan of Bridgham Engineering and Land Surveying entitled "Survey Plat of Transmission Line from North R.O.W. of Route 11 to McKay Station for Great Northern Paper Co., Inc., Sheets 1 through 4. (4.6 Transmission Line Easement; Ripogenus Transmission Line).

**SECTION II**

Certain lots or parcels of land situated in Penobscot, Piscataquis, and Somerset Counties, Maine, and flowage rights in Aroostook County, Maine, all as more fully described in this Schedule A.

Reference is made to deed from Great Northern Paper, Inc. ("GNP") and Maine Timberlands Company ("MTC") to GNE, LLC ("GNE") dated January 31, 2002, and recorded in the Penobscot County Registry of Deeds in Book 8063, Page 98, the Piscataquis County Registry of Deeds in Book 1366, Page 001, and the Somerset County Registry of Deeds in Book 2907, Page 340, as affected by that certain Corrective and Confirmatory Deed from Katahdin Paper Company LLC, Katahdin Timberlands LLC and Katahdin Forest Management LLC to Great Lakes Hydro America, LLC, ("GLHA") dated as of May 27, 2004, and recorded in said Penobscot County Registry of Deeds in Book 9349, Page 1; the Piscataquis County Registry of Deeds in Book 1561, Page 10; the Somerset County Registry of Deeds in Book 3313, Page 1, and also in the Aroostook County Registry of Deeds in Book 3975, Page 158. Further reference is made to the deed from Great Northern Paper, Inc. to Katahdin Paper Company LLC ("KPC") dated as of April 29, 2003, and recorded in the Penobscot County Registry of Deeds in Book 8702, Page 146, the Piscataquis County Registry of Deeds in Book 1461, Page 154, and the Somerset County Registry of Deeds in Book 3109, Page 149. Also, reference is made to the deed from Maine Timberlands Company to Katahdin Timberlands LLC ("KT') dated as of April 29, 2003, and recorded in the Penobscot County Registry of Deeds in Book 8702, Page 181, the Piscataquis County Registry of Deeds in Book 1461, Page 189, and the Somerset County Registry of Deeds in Book 3109, Page 184, and deed from Katahdin Timberlands LLC to Katahdin Forest Management LLC (collectively with Katahdin Timberlands LLC, "KT") dated February 26, 2004, and recorded in the Penobscot County Registry of Deeds in Book 9215, Page 177, the Piscataquis County Registry of Deeds in Book 1536, Page 177, and the Somerset County Registry of Deeds in Book 3273, Page 52.

Unless expressly stated otherwise herein, the terms KPC, KT, GNP, MTC, GLHA and GNE used herein shall be deemed to include the respective successors and assigns of each party.

EXCEPTING, however, the rights and interests granted in (1) Corrective Deed from GLHA to KT dated February 24, 2004 and recorded in the Penobscot County Registry of Deeds in Book 9214, Page 303, the Piscataquis County Registry of Deeds in Book 1535, Page 255, and the Somerset County Registry of Deeds in Book 3272, Page 344, and (2) Corrective Easement Deed from GLHA to KT dated as of May 27, 2004 and recorded in the Penobscot County Registry of Deeds in Book 9349, Page 156, the Piscataquis County Registry of Deeds in Book 1561, Page 1, and the Somerset County Registry of Deeds in Book 3313, Page 156.

1. **SOMERSET COUNTY**

1.1 Canada Falls

The land and interests in land including, without limitation, the dam and dam structures including a boat launch and canoe portage area at the outlet of Canada Falls Lake, in the Township of Pittston Academy Grant, County of Somerset, State of Maine being part of Township 2 Range 4 NBKP, also being part of the land now or formerly owned by GNP and being bounded and described more particularly as follows: Beginning, at a painted masonry nail set into the concrete abutment, on the northwest end of Canada Falls Lake Dam, located at UTM coordinate 16,666,989.55 North and 1,385,671.88 East, as acquired by G.P.S.;

thence, westerly, along the high water mark of Canada Falls Lake, at an elevation equal to the N.F.P.E. of 1238 feet MSL U.S.G.S., an approximate distance of 481 feet;

thence, along a UTM Grid north bearing of North 02°44'20" East, a distance of 10 feet to a #5 rebar set and capped #1027, having a tie-line bearing of South 78°07'40" West, a distance of 440.49 feet from the above mentioned masonry nail;

thence, continuing, North 02°44'20" East, a distance of 158.50 feet to a rebar set;

thence, continuing, North 02°44'20" East, a distance of 10 feet to the southerly shoulder of the Canada Falls Road; thence, easterly, along the southerly shoulder of the Canada Falls Road, a distance of 603 feet;

thence, South 82°23'20" East, a distance of 7 feet to a rebar set, having a tie-line bearing of North 75°33' 10" East, and a distance of 536.35 feet from last mentioned rebar set;

thence, continuing, South 72°00'40" East, a distance of 940.74 feet to a rebar set; thence, South 07°09'10" West, a distance of

484.54 feet to a rebar set;

thence, continuing, South 07'09'10" West, a distance of 11 feet to the high water mark of Canada Falls Lake;

thence, northwesterly and westerly, along the high water mark of Canada Falls Lake, at an elevation equal to the N.F.P.E. of 1238 feet MSL U.S.G.S., and along a low concrete dam an approximate distance of 592 feet to a painted masonry nail set into the southerly concrete wing wall of Canada Falls Dam, being on a tie-line bearing of North 44°03'40" West, and a distance of 543.20 feet from the last mentioned rebar set;

thence, along the face of the dam, North 72°00'40" West, a distance of 580.97 feet to the point of beginning. The above described parcel of land containing 8 acres, more or less.

The above-described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham, PLS #1027, and shown on a Plat having a revised date of August 12, 1999 and a published date of August 29, 2001. All bearings are calculated from UTM Grid, NAD27 Census datum, Zone 19 North. UTM coordinates are expressed in feet. Location Control by Trimble XL Pro GPS, with a minimum of 600 observations. Expected repeatability is 1.0 feet. Ground traverse was performed with an EDM. All monuments set were 5/8 inch metal rebar with yellow plastic caps affixed to them, with "D. Bridgham, PLS #1027" imprinted in the caps.

TOGETHER WITH:

i. Canada Falls Dam and dam structures.
ii. All of the land that lies between the high water mark of Canada Falls Lake which high water mark is at an elevation equal to the N.F.P.E. of 1238 feet MSL U.S.G.S. datum and a line lying ten feet horizontally outside of said high water mark of Canada Falls Lake.
iii. All islands within Canada Falls Lake.
iv. Canada Falls Lake and the bed of Canada Falls Lake.
v. All lands located upstream of the Canada Falls Dam that have been flowed by the dam.

vi. All flowage rights, whether acquired by Legislative Charter, by deed, by prescription or otherwise, over lands located upstream or downstream of the dam that, historically or currently have been flowed or flooded by Canada Falls Dam.

vii. A flowage easement for flowage of any lands conveyed herein, upstream or downstream of the dam, that may from time to time be flowed or flooded in the future by Canada Falls Dam, but only to the extent that such lands historically or currently have been flowed or flooded by this dam, and provided that such flowage easements for land upstream of the dam will not extend further than 1243 feet MSL U.S.G.S. datum.

The interests described in paragraphs (i) through (vii) affect property situated in Pittston Township (T2 R4 NBKP) and Soldiertown Township (T 2 R 3 NBKP) and may affect property situated in Hammond Township (T3 R4 NBKP).

Together with all flowage rights and interests in Alderbrook Township, whether acquired by Legislative Charter, by deed, by prescription or otherwise, over lands located upstream or downstream of the dam that historically or currently have been flowed or flooded by Canada Falls Dam.

1.2 Seboomook Lake

The land and interests in land including without limitation the dam and dam structures including a boat launch and canoe portage area at the outlet of Seboomook Lake, in Seboomook Township (T0 R4 NBKP), County of Somerset, State of Maine, being part of the land now or formerly owned by Great Northern Paper, Inc. and being bounded, and described as follows:

1.2.1 Seboomook Lake Dam

Beginning, at a painted masonry nail set into the concrete abutment, on the northwest side of the Seboomook Lake Dam, located at UTM coordinate 16,680,482.90 North and 1,453,542.18 East, as acquired by G.P.S.;

thence, southwesterly along the high water mark of Seboomook Lake, at an elevation equal to the N.F.P.E. of 1073 feet MSL

U.S.G.S. datum, an approximate distance of 729 feet;

thence, along a UTM Grid bearing of North 46°40'30" West, a distance of 29 feet to a #5 rebar set and capped #1027, located at UTM coordinate 16,680,154.06 North and 1,452,935.36 East, also having a tie-line bearing of South 61°32'50" West, and a distance of 690.19 feet from the above mentioned masonry nail;

thence, North 43°19'30" East, a distance of 1320.00 feet to a rebar set;

thence, South 46°40'30" East, a distance of 1471.00 feet to a #5 rebar set and capped #1027; thence, South 44°40'50" West, a distance of 423.82 feet to a rebar set;

thence, continuing, South 44°40'50" West, a distance of 10 feet to the northerly shoulder of the Seboomook Road;

thence, westerly along the northerly shoulder of the Seboomook Road, a distance of 258 feet, to the intersection of the northerly shoulder of the Seboomook Road and the centerline of the Seboomook Dam Road;

thence, continuing along the northerly shoulder of the Seboomook Road, a distance of 745 feet;

thence, North 46°40'30" West, a distance of 10 feet to a rebar set, having a tie-line bearing of South 75°10'30" West, and a distance of 1018.79 feet from the last mentioned rebar set;

thence, continuing, North 46°40'30" West, a distance of 44 feet to the high water mark of Seboomook Lake;

thence, easterly and northerly, along the high water mark of Seboomook Lake, at an elevation equal to the N.F.P.E. of 1073 feet MSL U.S.G.S. datum, an approximate distance of 777 feet to a painted masonry nail set into the southeasterly concrete abutment of the Seboomook Lake Dam, having a tie-line of North 26°30'40" East, and a distance of 651.39 feet from the last mentioned rebar set;

thence, North 46°32'50" West, a distance of 519.15 feet to the point of beginning. The above described parcel of land containing

27.3 acres +/-.

The above-described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham, PLS #1027, and shown on a Plat, having a revised dated of August 12, 1999 and a published date of August 30, 2001. All bearings are calculated from UTM Grid, NAD27 Census datum. Zone 19 North. UTM coordinates are expressed in feet. Location Control by Trimble XL Pro GPS, with a minimum of 600 observations. Expected repeatability is 1.0 feet. Ground traverse was performed with an EDM. All monuments set are 5/8 inch metal rebar with yellow plastic caps affixed to them, with "D. Bridgham, PLS #1027" imprinted in the caps.

TOGETHER WITH:

i. Seboomook Lake Dam and dam structures.
ii. All of the land that lies between the high water mark of Seboomook Lake which high water mark is at an elevation equal to the N.F.P.E. of 1073 feet MSL U.S.G.S. datum and a line lying ten feet horizontally outside of said high water mark of Seboomook Lake.
iii. All islands within Seboomook Lake.
iv. Seboomook Lake and the bed of Seboomook Lake.
v. All lands upstream of the Seboomook Lake Dam that have been flowed by the dam.
vi. All flowage rights, whether acquired by Legislative Charter, by deed, by prescription or otherwise, over lands located upstream or downstream of the dam that, historically or currently, have been flowed or flooded by Seboomook Lake Dam.
vii. A flowage easement for flowage of any lands conveyed herein, upstream or downstream of the Seboomook Lake Dam, that may from time to time be flowed or flooded in the future by Seboomook Lake Dam, but only to the extent that such lands historically or currently have been flowed or flooded by this dam, and provided that such flowage easements for land upstream of the dam will not extend further than 1078.5 feet MSL U.S.G.S. datum.

The interests described in paragraphs (i) through (vi) affect property situated in Seboomook Township (T0 R4 NBKP), Boyd Township (T1 R4 NBKP) and Pittston Township (T2 R4 NBKP).

1.2.2 Pittston Boat Launch

The land and interests in land, including a boat launch area on the southerly shore of Seboomook Lake, in the township of Pittston Academy Grant (T2 R4 NBKP), being located, bounded, and described as follows:

A certain parcel of land situated in Pittston Academy Grant (T2 R4 NBKP), County of Somerset, State of Maine being part of the land now or formerly owned by GNP being bounded and described more particularly as follows:

Beginning at a #5 rebar set in the ground and capped #1027, located at UTM coordinate 16,674,648.42 North and 1,396,754.26 East, having a UTM Grid tie-line bearing of, South 58°44'20" East, and a distance of 42.64 feet to a painted nail set into the root of a 5" white birch tree, said nail being further witnessed as having a tie-line bearing of, South 52°12'30" East and a distance of,

190.66 feet to a painted nail set into the root of a 15" spruce tree, marked with a "P";

thence, North 34°35'20" East, a distance of 10 feet to the high water mark of Seboomook Lake, at an elevation equal to the

N.F.P.E. of 1073 feet MSL U.S.G.S.;

thence, southeasterly along the high water mark of said Lake, an approximate distance of 279 feet; thence, South 34°00'50" West, a distance of 10 feet to a rebar set, having a tie-line bearing of South 55° 59'10" East, and a distance of 279.00 feet from above mentioned rebar set;

thence, continuing, South 34°00'50" West, a distance of 131.00 feet to a rebar set, having a tie-line bearing of, North 43°08'30" West, a distance of 566.62 feet from the intersection of the centerlines of the Old Pittston Road and an unnamed road;

thence, North 59°27'10" West, a distance of 281.00 feet to a rebar set; thence, North 34°35'20" East, a distance of 148.00 feet to the point of beginning. The above described parcel of land containing 1 acre +/-

The above-described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham, PLS #1027, and shown on a Plat having a revised date of August 11, 1999 and a published date of August 29, 2001. All bearings are calculated from UTM Grid, NAD27 Conus Datum, Zone 19 North. UTM coordinates are expressed in feet. Location Control by Trimble XL Pro GPS, with a minimum of 600 observations. Expected repeatability is 1.0 feet. Ground traverse was performed with EDM. All monuments set are 5/8 inch metal rebar with yellow plastic caps affixed to them, with "D. Bridgham, PLS #1027" imprinted in the caps.

1.3 Long Pond Dam

The land and interests in land including, without limitation, the dam and dam structures and an informal boat launch area at the outlet of Long Pond, in Dole Brook Township T3 R5 NBKP, County of Somerset, State of Maine, being part of the land now or formerly owned by GNP and being bounded and described more particularly as follows:

Beginning, at a masonry nail in the concrete abutment, on the southwest side of the Long Pond Dam, located at UTM coordinate 16,708,393.04 North and 1,343,096.49 East, as acquired by G.P.S.;

thence, southerly along the high water mark of Long Pond, at an elevation equal to N.F.P.E. of 1491 feet MSL U.S.G.S., an approximate distance of 900 feet to a point on the shore;

thence, along a UTM Grid bearing of, South 37°19'30" West, a distance of 30 feet to a #5 rebar set and capped #1027, located at UTM coordinate 16,707,591.24 North and 1,343,008.43 East, also having a tie-line bearing of, South 06°16'00" West, a distance of

806.62 feet from above mentioned masonry nail; thence, continuing, South 37°19'30" West, a distance of 418.68 feet to a rebar set;

thence, continuing, South 37°19' 30" West, a distance of 15 feet to the lakeside shoulder of the Cheney Pond Road;

thence, northerly along the lakeside shoulder of said Road, a distance of 897 feet, to the intersection of the lakeside shoulder of the Cheney Pond Road and the extension of the centerline of the Gravel Pit Road;

thence, continuing in an easterly direction along the lakeside shoulder of the Cheney Pond Road, a distance of 834 feet to the intersection of the Cheney Pond Road, and the extension of the centerline of the Dole Pond Road;

thence, continuing in an easterly direction along the lakeside shoulder of the Long Pond Road, a distance of 486 feet; thence, South 37°19'30" West, a distance of 15 feet to a rebar set;

thence, continuing, South 37°19'30" West, a distance of 150.11 feet to a rebar set;

thence, continuing, South 37°19'30" West, a distance of 30 feet to the high water mark of Long Pond;

thence, northwesterly and westerly along the high water mark of Long Pond, at an elevation equal to N.F.P.E. of 1491 feet MSL U.S.G.S., an approximate distance of 500 feet, to a painted masonry nail set into the northeast end of the concrete abutment of Long Pond Dam, having a tie- line bearing of, North 87°01'50" West, and a distance of 491.41 feet from the last mentioned rebar set;

thence, South 84°28'20" West, a distance of 14.28 feet to the point of beginning. The above described parcel of land containing

10.8 acres more or less.

The above-described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham, PLS #1027, and shown on a Plat having revised dates of August 11, 1999 and September 20, 2001 and a published date of August 29, 2001. All bearings are calculated from UTM Grid, NAD27 Census datum, Zone 19 North. UTM coordinates are expressed in feet.

Location Control by Trimble XL Pro GPS, with a minimum of 600 observations. Expected repeatability is 1.0 feet. Ground traverse was performed with and EDM. All monuments set are 5/8 inch metal rebar with yellow plastic caps affixed to them, with "D. Bridgham, PLS #1027" imprinted in the caps.

TOGETHER WITH:

i. Long Pond Dam and dam structures.
ii. An easement over lands located upstream and in the vicinity of the Long Pond Dam for purposes of maintaining, repairing and replacing Long Pond Dam and dam structures provided that any new dam must be located within the vicinity of the existing dam.
iii. All flowage rights, whether acquired by Legislative Charter, by deed, by prescription or otherwise, over lands located upstream or downstream of the Long Pond Dam that historically or currently have been flowed or flooded by Long Pond Dam.
iv. A flowage easement for flowage of any lands conveyed herein, upstream or downstream of the dam, that may from time to time be flowed or flooded in the future by Long Pond Dam, but only to the extent that such lands historically or currently have been flowed or flooded by this dam, and provided that such flowage easements for land upstream of the dam will not extend further than 1494.0 MSL U.S.G.S. datum.

The interests described in paragraphs (i) through (iv) affect property situated in Dole Brook Township (T 3 R 5 NBKP).

Expressly including in the property conveyed to GNE all right, title and interest, if any, in and to the bed of Long Pond.

1.4 Penobscot Lake

The land and interests in land including, without limitation, the dam and dam structures at the outlet of Penobscot Lake, located in Prentiss Township, County of Somerset, State of Maine being part of T4 R4 NBKP, also being part of the land now or formerly owned by GNP and being bounded and described more particularly as follows:

Beginning, at a painted masonry nail set into the concrete abutment, on the northeast side of Penobscot Lake Dam, located at UTM coordinate 16,681,838.98 North and 1,329,503.65 East, as acquired by G.P.S.;

thence, northeasterly along the high water mark of Penobscot Lake, at an elevation equal to the N.F.P.E. of 1603 feet MSL U.S.G.S., an approximate distance of 476 feet to a point on the shore;

thence, along a UTM Grid bearing of, South 17°57'40" East, a distance of 14 feet to a #5 rebar set and capped #1027, located at UTM coordinate 16,682,126.64 North and 1,329,869.51 East, also having a tie-line bearing of North 51°49'20" East, and a distance of 465.41 feet from the above mentioned masonry nail;

thence, continuing, South 17°57'40" East, a distance of 406.00 feet to a rebar set; thence, South 68°54'40" West, a distance of

777.33 feet to a rebar set;

thence, North 17°57'40" West, a distance of 501.00 feet to a rebar set; thence, North 72°02'20" East, a distance of 112.00 feet to a rebar set;

thence, continuing, North 72°02'20" East, a distance of 30 feet to the high water mark of Penobscot Lake;

thence, southerly and easterly along the high water mark of Penobscot Lake, at an elevation equal to the N.F.P.E. of 1603 feet MSL U.S.G.S., an approximate distance of 375 feet to a painted masonry nail set into the southwest concrete abutment of Penobscot Lake Dam, having a tie-line bearing of, South 61°56' 30" East, a distance of 301.28 feet from last mentioned rebar set; thence, North 61°32'00" East, a distance of 18.54 feet to the point of beginning. The above described parcel of land containing 6.3 acres more or less.

The above-described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham, PLS #1027, and shown on a Plat having a revised date of August 12, 1999 and a published date of August 29, 2001. All bearings are calculated from UTM Grid, NAD27 Census datum, Zone 19 North. UTM coordinates are expressed in feet. Location Control by Trimble XL Pro GPS, with a minimum of 600 observations. Expected repeatability is 1.0 feet. Ground traverse was performed with and EDM. All monuments set are 5/8 inch metal rebar with yellow plastic caps affixed to them, with "D. Bridgham, PLS #1027" imprinted in the caps.

TOGETHER WITH:

i. Penobscot Lake Dam and dam structures.

ii. An easement over lands located upstream and in the vicinity of the Penobscot Lake Dam for purposes of maintaining, repairing and replacing Penobscot Lake Dam and dam structures provided that any new dam must be located within the vicinity of the existing dam.

iii. All flowage rights, whether acquired by Legislative Charter, by deed, by prescription or otherwise, over lands located upstream or downstream of the Penobscot Lake Dam that historically or currently have been flowed or flooded by Penobscot Lake Dam.

iv. A flowage easement for flowage of any lands conveyed herein, upstream or downstream of the dam, that may from time to time be flowed or flooded in the future by Penobscot Lake Dam, but only to the extent that such lands historically or currently have been flowed or flooded by this dam, and provided that such flowage easements for land upstream of the dam will not extend further than 1607.4 MSL U.S.G.S. datum.

The interests described in paragraphs (i) through (iv) affect property situated in Prentiss Township (T4 R4 NBKP), Hammond Township (T 3 R 4 NBKP), Dole Brook Township (T3 R5 NBKP), and Penobscot Lake Township (T4 R5 NBKP).

Expressly including in the property conveyed to GNE all right, title and interest, if any, in and to the bed of Penobscot Lake. 1.5 Dole Pond Dam

The land and interests in land including, without limitation, the dam and dam structures at the outlet of Dole Pond, in the Township

of Dole Brook, T3 R5 NBKP, County of Somerset, State of Maine being part of the land now or formerly owned by GNP and being bounded and described more particularly as follows:

Beginning at a painted masonry nail in the concrete abutment, on the northwest side of the Dole Pond Dam, located at UTM coordinate 16,718,356.14 North and 1,337,148.76 East, as acquired by G.P.S.; thence, southwesterly along the high water mark of Dole Pond, at an elevation equal to N.F.P.E. of 1413 feet MSL U.S.G.S., an approximate distance of 252 feet;

thence; along a UTM Grid bearing of, North 41°47'30" West, a distance of 10 feet to a #5 rebar set and capped #1027, located at UTM coordinate 16,718,270.58 North and 1,336,933.34 East, having a tie-line bearing of South 68°20'10" West, and a distance of

231.79 feet from the above mentioned masonry spike;

thence, continuing, North 41°47'30" West, a distance of 325.46 feet to a rebar set;

thence, continuing, North 41°47'30" West, a distance of 10 feet to the southeast shoulder of the Dumas Road;

thence, easterly along the southerly shoulder of the Dumas Road 181 feet to the intersection of the southerly shoulder on said Dumas Road and the centerline of the Boundary Road;

thence, continuing easterly along the southerly shoulder of said Dumas Road, 373 feet;

thence, South 42°09'40" East, a distance of 10 feet to a rebar set, having a tie-line bearing of, North 69°24'00" East, a distance of

526.41 feet from the last mentioned rebar;

thence, continuing, South 42°09'40" East, a distance of 1108.42 feet to a rebar set;

thence, continuing, South 42°09'40" East, a distance of 10 feet to the northerly shoulder of the Dole Brook Road;

thence, along the northerly shoulder of said Dole Brook Road, South 50°14'30" West, a distance of 182 feet to the intersection of the northerly shoulder of said Road and the centerline of the Boundary Road; thence, South 50°14'30" West, a distance of 46.17 feet to a rebar set;

thence, continuing, South 50°14'30" West, a distance of 273.83 feet to a rebar set; thence, North 41°47'30" West, a distance of 191.62 feet to a rebar set;

thence, North 41°47'30" West, a distance of 10 feet to the high water mark of Dole Pond;

thence, northeasterly and northwesterly, along the high water mark of Dole Pond, at an elevation equal to N.F.P.E. of 1413 feet MSL U.S.G.S., in a generally northerly direction, to a painted masonry nail in the southeast concrete abutment of Dole Pond Dam, located at UTM 16,718,336.60 North and 1,337,169.57 East, having a tie-line bearing of North 23°25'20" West, and a distance of 698.59 feet from the last above mentioned rebar set;

thence, North 46°48'40" West, a distance of 28.55 feet to the point of beginning. The above described parcel of land containing 12 acres more or less.

The above-described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham, PLS #1027, and shown on a Plat having a revised date of August 11, 1999 and a published date of August 29, 2001. All bearings are calculated from UTM Grid, NAD27 Census datum, Zone 19 North. UTM coordinates are expressed in feet. Location Control by Trimble XL Pro GPS, with a minimum of 600 observations. Expected repeatability is 1.0 feet. Ground traverse was performed with and EDM.

All monuments set are 5/8 inch metal rebar with yellow plastic caps affixed to them, with "D. Bridgham, PLS #1027" imprinted in the caps.

TOGETHER WITH:

i. Dole Pond Dam and dam structures.
ii. All of the land that lies between the high water mark of Dole Pond which high water mark is at an elevation equal to the N.F.P.E. of 1413 feet MSL U.S.G.S. datum and a line lying ten feet

horizontally outside of said high water mark of Dole Pond.

iii. All islands within Dole Pond.

iv. Dole Pond and the bed of Dole Pond.

v. All lands located upstream of the Dole Pond Dam that have been flowed by the dam.

vi. All flowage rights, whether acquired by Legislative Charter, by deed, by prescription or otherwise, over lands located upstream or downstream of the Dole Pond Dam that historically or currently have been flowed or flooded by Dole Pond Dam.

vii. A flowage easement for flowage of any lands conveyed herein, upstream or downstream of the dam, that may from time to time be flowed or flooded in the future by Dole Pond Dam, but only to the extent that such lands historically or currently have been flowed or flooded by this dam, and provided that such flowage easements for land upstream of the dam will not extend further than 1417.5 MSL U.S.G.S. datum.

The interests described in paragraphs (i) through (vii) affect property situated in Dole Brook Township (T3 R5 NBKP).

## 2. PISCATAQUIS COUNTY

### 2.1 Caucomgomoc Lake Boat Launch

A certain parcel of land situated in Township T6 R15 WELS, County of Piscataquis, State of Maine being part of the land now or formerly owned by Great Northern Paper, Inc. and being bounded and described more particularly as follows:

Commencing, at the intersection of the Caucomgomoc Depot Road so-called, and an unnamed road leading to the East, this intersection being located approximately 455 feet northerly of the Township 6, Range 15 WELS North Town Line;

Thence, easterly and southeasterly along said unnamed road a distance of 2230 feet to the intersection of the unnamed road and the North Town Line of Township 6, Range 15 WELS;

Thence, easterly along the painted North Town Line of Township 6. Range 15 WELS, a distance of 248 feet to a #5 rebar set and capped #1027, being approximately 30 feet from the high water mark of Caucomgomoc Lake, located at UTM coordinate 16,790,336.61 North and 1,479,070.26 East, as acquired by G.P.S.;

Thence, along a UTM Grid tie-line bearing of, South 50°21'20" East, and a distance of 255.62 feet to a #5 rebar set in the ground, being the POINT OF BEGINNING, also being a tie-line bearing of, North 16°17' 50" West, and a distance of 30.60 feet from a painted spike set in the root of a 20" yellow birch tree, said #5 rebar located at UTM coordinate 16,790,173.52 North and 1,479,267.09 East as acquired by G.P.S., further witnessed by a 15" spruce tree, having a painted nail pinned in a root located at UTM coordinate 16,790,110.37 North and 1,479,381.67 East as acquired by G.P.S. being on a tie line of North 61°08'20" West, and a distance of 130.83 feet;

Thence, North 35°20'30" East, a distance of 10 feet to the high water mark of Caucomgomoc Lake; Thence, southeasterly along the high water mark of Caucomgomoc Lake, at an elevation equal to the N.F.P.E. of 998 feet MSL U.S.G.S. datum;

Thence, South 35°20'30" West, a distance of 10 feet to a rebar set, located at UTM coordinate 16,790,063.85 North and 1,479,440.29 East, being a tie-line bearing of, South 57°39'30" East, a distance of 205.00 feet from the above mentioned rebar set; Thence, South 35°20'30" West, a distance of 200.00 feet to a rebar set;

Thence, North 54°35'00" West, a distance of 204.72 feet to a rebar set;

Thence, North 35°20'30" East, a distance of 189.00 feet to the POINT OF BEGINNING. The above described parcel of land containing 1 acre +/.

The above-described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham, PLS #1027, and shown on a Plat having a revised date of August 11, 1999 revised through May 22, 2002. All bearings are calculated from UTM Grid, NAD27 Census datum, Zone 19 North. UTM coordinates are expressed in feet. Location Control by Trimble XL Pro GPS, with a minimum of 600 observations. Expected repeatability is 1.0 feet. Ground traverse by EDM. All monuments set are 5/8 inch metal rebar with yellow plastic caps affixed to them, with "D. Bridgham, PLS #1027" imprinted in the caps. Entrance road data were acquired and supplied by Bowater staff.

2.2 Caucomgomoc Lake Dam Lot

A certain lot or parcel of land with the buildings and improvements thereon, situated in the north half of Township 6, Range 14, W.E.L.S., County of Piscataquis, State of Maine and being more particularly described as follows:

Beginning at a point 50 feet easterly of the centerline of a gravel road, said point being located S 16°01'00" E, a distance of 1485.05 feet from an "X" chiseled in the top of a concrete curb at the northwest corner of the Caucomgomoc Dam;

Thence N 10°06'23" E, at all times 50 feet from the centerline of said gravel road, a distance of 816.41 feet to the point of tangency of a curve to the left;

Thence in a general northwesterly direction, at all times 50 feet from the centerline of said gravel road, along said curve to the left with a radius of 400.00 feet an arc distance of 254.12 feet to a point of tangency;

Thence N 26°17'35" W, at all times 50 feet from the centerline of said gravel road, a distance of 58.37 feet to a point of tangency of a curve to the left;

Thence in a general northwesterly direction, at all times 50 feet from the centerline of said gravel road, along said curve to the left with a radius of 221.32 feet an arc distance of 199.00 feet to a point of tangency;

Thence N 77°48'37" W, at all times 50 feet from the centerline of said gravel road, a distance of 172.10 feet to a point defined by the intersection of this line with a line 70 feet easterly of and parallel to the easterly face of said Caucomgomoc Dam;

Thence N 23°53'02" W, parallel to and 70 feet distant from said easterly face of Caucomgomoc Dam, crossing Caucomgomoc Stream, a distance of 277.05 feet to a point defined by the intersection of this line with a line offset 50 feet easterly of said gravel road;

Thence N 27°41'11" E, at all times 50 feet from the centerline of said gravel road, a distance of 489.09 feet to a point of tangency of a curve to the right;

Thence in a general northeasterly direction, at all times 50 feet from the centerline of said gravel road, along said curve to the right with a radius of 210.00 feet an arc distance of 195.48 feet to a point of tangency;

Thence N 81°01'11" E, at all times 50 feet from the centerline of said gravel road, a distance of 265.43 feet to a point; Thence N 8'58'49" W, crossing said gravel road, a distance of 100.00 feet to a point;

Thence S 81°01'11" W, at all times 50 feet from the centerline of said gravel road, a distance of 265.43 feet to a point of tangency of a curve to the left;

Thence in a general southwesterly direction, at all times 50 feet from the centerline of said gravel road, along said curve to the left with a radius of 310.00 feet an arc distance of 288.56 feet to a point of tangency;

Thence S 27°41'11" W, at all times 50 feet from the centerline of said gravel road, a distance of 524.10 feet to the low water mark of Caucomgomoc Lake;

Thence in a general southerly direction, by and along said low water mark, a distance of 83 feet, more or less, to a point defined by the intersection of said low water mark with a line 50 feet westerly of and parallel to the westerly face of said Caucomgomoc Dam, said point being located S 14°03'11" W, a distance of 82.44 feet from the last described point;

Thence S 24°06'27" E, 50 feet distant from and parallel to said westerly face of Caucomgomoc Dam, a distance of 290.97 feet to a point defined by the intersection of this line with a line offset 50 feet westerly of said gravel road;

Thence S 77°48'37" E, at all times 50 feet from the centerline of said gravel road, a distance of 271.39 feet to a point of tangency of a curve to the right;

Thence in a general southeasterly direction, at all times 50 feet from the centerline of said gravel road, along said curve to the right with a radius of 121.32 feet an arc distance of 109.08 feet to a point of tangency;

Thence S 26°17'35" E, at all times 50 feet from the centerline of said gravel road, a distance of 58.37 feet to a point of tangency of a curve to the right;

Thence in a general southerly direction, at all times 50 feet from the centerline of said gravel road, along said curve to the right with a radius of 300.00 feet an arc distance of 190.59 feet to a point of tangency; Thence S 10°06'23" W, at all times 50 feet from the centerline of said gravel road, a distance of 816.41 feet to a point;

Thence S 79°53'37" E, crossing said gravel road, a distance of 100.00 feet to the point of beginning; Containing 6.72 acres, more or less.

Subject to the rights of others in and to the gravel road as referenced herein.

Being the same parcel described as the eighth parcel in a deed from Cassidy, et. al. to Great Northern Nekoosa Corporation dated December 29, 1988 and recorded in the Piscataquis County Registry of Deeds in Book 708, Page 162.

Curve data cited herein are based on field location of existing gravel road. Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NED.

TOGETHER WITH:

i. Caucomgomoc Lake Dam and dam structures.
ii. All of the land that lies between the high water mark of Caucomgomoc Lake which high water mark is at an elevation equal to the N.F.P.E. of 998 MSL U.S.G.S. datum and a line lying ten feet horizontally outside of said high water mark of Caucomgomoc Lake.
iii. All islands within Caucomgomoc Lake.
iv. Caucomgomoc Lake and the bed of said lake.
v. All lands upstream of the Caucomgomoc Lake Dam that have been flowed by the dam.
vi. All flowage rights, whether acquired by Legislative Charter, by deed, by prescription or otherwise, over lands located upstream or downstream of the dam that, historically or currently, have been flowed or flooded by the Caucomgomoc Lake Dam.
vii. A flowage easement for flowage of any of the lands herein conveyed, upstream or downstream of the dam, that may from time to time be flowed or flooded in the future by this dam, but only to the extent that such lands historically or currently have been flowed or flooded by this dam, and provided that such flowage easements for land upstream of the dam will not extend further than 1005.5 MSL U.S.G.S. datum.
viii. Including, without limitation, all rights associated with the GNP Hydroelectric System previously retained and acquired by GNP in the following deeds recorded in the Piscataquis County Registry of Deeds: (i) deed dated February 23, 1983 and recorded at Book 537, Page 352; (ii) deed dated December 28, 1984 and recorded at Book 572, Page 189; (iii) deed dated

December 16, 1988 and recorded at Book 708, Page 174; and (iv) deed dated July 29, 1988 and recorded at Book 708, Page 78.

The interests described in paragraphs (i) through (vii) affect property situated in T6 R15 NE/2 WELS and T7 R15 E/2 WELS and may affect property in T6 R14 WELS and T7 R14 WELS.

2.3 Loon Lake Dam

A certain parcel of land, including without limitation, the dam and dam structures at the outlet of Loon Lake, situated in Township T6, R14 WELS and Township 6, Range 15 WELS. County of Piscataquis, State of Maine, being part of the land now or formerly owned by Great Northern Paper, Inc. and being bounded and described more particularly as follows:

Commencing at a painted nail found in the concrete abutment, on the northerly side of Loon Lake Dam, and located at UTM coordinate 16,760,313.33 North and 1,487,986.03 East, as acquired by G.P.S., this point of commencement is also North 30°05'20" West, along the Dam concrete abutment a distance of 37.59 feet from a second painted nail found in the concrete abutment;

Thence, to a #5 rebar set and capped #1027, located at UTM coordinate 16,760,313.78 North and 1,487,851.05 East, also being on a UTM Grid tie-line bearing of North 89°48'30" West, and a distance of 134.97 feet from the above-mentioned nail, this rebar being the true Point of Beginning;

Thence, North 13°29'50" West, a distance of 266.03 feet to a rebar set; Thence, North 82°00'40" East, a distance of 509.97 feet to a rebar set;

Thence, continuing North 82°00'40" East, a distance of 15 feet to the westerly shoulder of the Caucomgomoc Depot Road, so- called;

Thence, southerly along the westerly shoulder of said road 830 feet;

Thence, North 89°33'00" West, a distance of 15 feet, to a scribed and painted cedar post found labeled Cassidy, said post marking the easterly end of an existing painted and blazed lot line, and also having a tie line bearing of, South 9°34'20" East and a distance of 826.11 feet from the last mentioned rebar;

Thence, along the blazed and painted line, North 89°33'00" West, a distance of 451.97 feet to a rebar set, being the point of intersection of said blazed lot line and a blazed and painted Township Line;

Thence, continuing on the same course, North 89°33'00" West, an approximate distance of 50 feet, to the high water mark of Loon Lake at an elevation equal to the N.F.P.E. of 1027 feet MSL U.S.G.S. datum;

Thence, northerly and westerly along the high water mark of said Lake, at an elevation equal to the N.F.P.E. of 1027 feet MSL

U.S.G.S. datum to a painted masonry nail at the south end of Loon Lake Dam, also being on a tie-line bearing of, North 03°16'40" E, a distance of 449.05 feet from the last mentioned rebar;

Thence, continuing northerly along the westerly side of said Dam, North 30°05'20" W, a distance of 37.59' to a painted masonry nail on the northerly side of said Dam and also being the above mentioned point of commencement;

Thence, continuing northerly and westerly along the high water mark of said Lake, at an elevation equal to the N.F.P.E. of 1027 feet MSL U.S.G.S. datum to a point being South 13'29'50" East approximately 26 feet from the Point of Beginning;

Thence, North 13°29'50" West, a distance of approximately 26 feet to the Point of Beginning. The above described parcel of land containing 8 acres more or less.

Also including all of the dam structure westerly of the two painted masonry nails mentioned above.

The above described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham, PLS #1027, and shown on a Plat having a revised date of August 11, 1999 and revised on September 7, 2001 and revised on May 22, 2002. All bearings are calculated from UTM Grid, NAD27 Conus datum, Zone 19 North. UTM coordinates are expressed in feet. Location Control by Trimble XL Pro GPS, with a minimum of 600 observations. Expected repeatability is 1.0 feet. Ground traverse was performed with an EDM. All monuments set are 5/8 inch metal rebar with yellow plastic caps affixed to them, with "D. Bridgham, PLS #1027" imprinted in the caps.

TOGETHER WITH:

i. Loon Lake Dam and the dam structures.
ii. An easement over lands located upstream of and in the vicinity of Loon Lake Dam for purposes of maintaining, repairing and replacing Loon Lake Dam and dam structures, provided that any new dam must be located in the vicinity of the existing dam.
iii. All flowage rights, whether acquired by Legislative Charter, by deed, by prescription or otherwise, over lands located upstream or downstream of the Loon Lake Dam that, historically or currently have been flowed or flooded by Loon Lake Dam.
iv. A flowage easement for flowage of any of lands conveyed herein, upstream or downstream of Loon Lake Dam, that may from time to time be flowed or flooded in the future by said dam, but only to the extent that such lands historically or currently have been flowed or flooded by this dam, and provided that such flowage easements for land upstream of the dam will not extend further than 1030.0 MSL U.S.G.S. datum.

The interests described in paragraph (i) through (iv) affect property situated in T6 R14 S/2 WELS and T6 R15 NE/2 WELS. Expressly including in the property conveyed to GLHA all right, title and interest, if any, in and to the bed of Loon Lake.

2.4 Umbazooksus Lake

A certain parcel of land including, without limitation, the dam and dam structures, situated in Township 6, Range 13 WELS, County of Piscataquis, State of Maine, also being part of the land now or formerly owned by GNP bounded and described more particularly as follows:

Beginning at a railroad spike, set, on the southerly side of the Longley Stream Road near the westerly end of the bridge over the Umbazooksus Stream, near the high water mark of said stream, said railroad spike having an approximate UTM coordinate of N: 16,762,613.7, E: 1,548,532.0;

Thence, generally northerly, crossing said Longley Stream Road, to the high water mark of the connecting waterway between Umbazooksus Lake and Umbazooksus Cove, said high water mark being at an elevation of 941.59 feet MSL;

Thence, generally westerly, northerly and northeasterly along the westerly side of said connecting waterway, following said 941.59' contour to the remains of the dam at the southerly end of Umbazooksus Lake;

Thence, following the dam to the high water mark of said Umbazooksus Lake, said high water mark being at an elevation of 947.0 feet MSL;

Thence, generally northwesterly, northerly, southeasterly, and southerly around the body of Umbazooksus Lake, following said 947.0' contour, back to said dam;

Thence, following said dam to the easterly side of the connecting waterway between Umbazooksus Lake and Umbazooksus Cove, to the high water mark at 941.59 feet MSL;

Thence, generally southwesterly, along the easterly side of said connecting waterway, following said 941.59' contour, to a point near the east end of the Longley Stream Road Bridge;

Thence, crossing said Longley Stream Road , to a railroad spike, set, near the high water mark of

Umbazooksus Stream, aforementioned, said railroad spike having approximate UTM coordinates of N: 16,762,482.3, E: 1,548,254.3;

Thence, crossing said Umbazooksus Stream, South 64°40'50" West, a distance of 307.21 feet to the point of beginning.

The above described parcel containing approximately 120 acres in the connecting waterway, and approximately 1600 acres in Umbazooksus Lake.

The above described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham, PLS #1027, and shown on a Plat dated September 4, 2001. Coordinates are UTM feet Conus Datum, Zone 19 North. Location Control by Trimble XL Pro GPS, with a minimum of 600 observations.

TOGETHER WITH:

i. All flowage rights, whether acquired by Legislative Charter, by deed, by prescription or otherwise, over lands located upstream or downstream of the Umbazooksus Lake Dam that, historically or currently have been flowed or flooded by Umbazooksus Lake Dam.

ii. A flowage easement for flowage of any of lands conveyed herein, upstream or downstream of Umbazooksus Lake Dam, that may from time to time be flowed or flooded in the future by said clam, but only to the extent that such lands historically or currently have been flowed or flooded by this dam, and provided that such flowage easements for land upstream of the dam will not extend further than 947.0 MSL U.S.G.S. datum.

iii. All islands within Umbazooksus Lake.

2.5 T3 R11 Ripogenus Lake

Two certain parcels of land on the shore of Ripogenus Lake in Township T3 R11 WELS being a strip of land 250.00 feet wide extending from the High Water Line at an elevation of 941.59 MSL of said water body landward and to a line at all times 250.00 feet from said high water line of said water body.

2.5.1 North Shore

Beginning at a rebar set on the northerly shore of Ripogenus Lake, on a blazed and painted line found being the Town Line between T3 R11 and T3 R12 WELS, and at UTM coordinates of N 16671617.69, E 1590818.94 feet;

Thence, northerly along said Town Line to a point that is 250.00 feet from the high water line of said Lake; Thence, easterly and southerly along a line that is always 250.00 feet from said high water line of said Lake to intersect with the Ripogenus Dam Lot as surveyed by Bridgham;

Thence, continuing westerly along said Dam Lot, South 78°36'50" West, to a station set by Bridgham at UTM Coordinates of N 16669093.79, E 1595119.81 feet, and also on a tie line bearing of, South 59°35'40" E, a distance of 4986.70 feet from the above mentioned rebar;

Thence continuing southerly, South 19°42'30" West, to the high water line of said Lake;

Thence, westerly and northerly along said high water line to said Town Line; Thence, northerly along said Town Line to the Point of Beginning.

Subject to a 100.00 foot wide right-of-way for the Frost Pond Road as now located and described as follows:

Beginning at a point 50 feet southwesterly of the center line of said road, that is also 250.00 feet from the high water line of said Lake, and that is also, South 71°36'40" East, a distance of 2463.40 feet from the point of beginning described immediately above; Thence, crossing said Road to a point 50.00 feet northeasterly of the centerline of said Road being, North 85°26'00" East, a distance of 104.02 feet from

the last point;

Thence, continuing 50.00 feet from the center of said Road to a rebar set being South 25°40'10" East, a distance of 155.97 feet from the last point and located at UTM coordinates of N 16670840.45, E 1593156.53 feet;

Thence, continuing along said right-of-way to another rebar set being, South 51°37'10" East, a distance of 1091.56 feet;

Thence, continuing along said right-of-way to a point that is, South 37°59'40" East, a distance of 261.26 feet, said point also being

250.00 feet from the high water line of said Lake;

Thence, along said line always being 250.00 feet from said high water line and crossing said Road to a point that is, South 11°43'30" West, a distance of 120.22 feet, and on the other right-of-way line of said Road;

Thence, northwesterly along said other right-of-way and always 100.00 feet from the right-of-way line described immediately above to the point of beginning.

2.5.2 South Shore

Commencing at a railroad spike set on the South shore of Ripogenus Lake being at the point shown on the Survey of Ripogenus Dam by Bridgham, and at UTM coordinates of N 16667626.50, E 1594801.32 feet;

Thence, North 84°44'00" West, a distance of 50 feet, more or less, to a point at or near the high water line of Ripogenus Lake and the land described in Section 2.19 herein, such point being the POINT OF BEGINNING;

Thence, South 06°56'10" West along said land described in Section 2.19 to a point that is 250.00 feet measured perpendicularly, from the high water line of said Lake;

Thence, westerly and northerly along a line that is always 250.00 feet from said high water line of said Lake to the Town Line between T3-R11 and T3-R12 WELS;

Thence, northerly along said Town Line to a rebar set on the southerly shore of Ripogenus Lake on a blazed and painted line, and also being on a tie line bearing of, North 79'48'30" W, a distance of 3972.24 feet from the above mentioned Railroad Spike; Thence, northerly to the high water line of said Lake;

Thence, southerly and easterly along said high water line to the Ripogenus Dam Parcel and the POINT OF BEGINNING. Subject to a 100.00 foot wide right-of-way for the Golden Road as now located and described as follows; Beginning at a point 50 feet northeasterly of the center line of said road, that is 250.00 from the high water line of said Lake;

Thence, crossing said Road to a point 50.00 feet southwesterly of the center line of said Road being, South 61°42'30" West, a distance of 192.63 feet from the last point;

Thence, continuing along said right-of-way line that is 50.00 feet from the center of said Road to a rebar set being, North 89°57'10" West, a distance of 616.98 feet from the last point and located at UTM coordinates of N 16,667,183.89, E 1,593,846.30 feet; Thence, continuing along said right-of-way to another rebar set being, South 89°05'00" West, a distance of 651.47 feet;

Thence, continuing along said right-of-way to a point that is, North 88°10'50" West, a distance of 360.29 feet, said point also being

250.00 feet from the high water line of said Lake;

Thence, along said line always bring 250.00 feet from said high water line and crossing said Road to a point that is, North 50°30'20" West, a distance of 169.84 feet from the last point and being on the other right-of-way line of said Road;

Thence, southeasterly along said other right-of-way and always 100.00 feet from the right-of-way line described immediately above to the point of beginning.

2.6 T3 R12 Chesuncook Lake Area

Four certain parcels of land on Chesuncook Lake in Township T3 R12 WELS being strips of land 250.00 feet wide extending from the High Water Line at an elevation of 941.59 MSL of said water bodies landward and to a line at all times 250.00 feet from said high water line of said water body.

Excepting from the Chesuncook Lake area, that portion of the premises conveyed in deed from Great Lakes Hydro America, LLC to West Branch Historical Preservation Committee recorded on May 1, 2017 in the Piscataquis Registry of Deeds in Book 2488, Page 228, but reserving to Great Lakes Hydro America, LLC all appurtenant rights, flowage rights, and flowage easements as set forth therein.

Together with any and all right, title and interest of Katahdin Forest Management, LLC and the State of Maine, Department of Agriculture, Conservation and Forestry as set forth in Corrective Deed Confirming Boundary Line to Great Lakes Hydro America, LLC dated October 16, 2014 and recorded in the Piscataquis County Registry of Deeds in Book 2333, Page 160.

2.6.1 Northeast Shore First Parcel

Beginning at a cedar post found and rebar set on the northeasterly shore of Chesuncook Lake on the Town Line between T4 R12 and T3 R12 WELS at UTM coordinates of N 16689917.58, E 1561719.17 feet;

Thence, easterly along said Town Line to a point that is 250.00 feet from the high water line of said Lake; Thence, southeasterly along a line that is always 250.00 feet from said high water line of said Lake to a developed Lease;

Thence, along said Lease, South 50°32'10 West, to a rebar set;

Thence, continuing on the same course, a distance of 95.98 feet to a rebar set approximately 50 feet from the high water line on a high bank, said rebar being, South 42°16'40" East, a distance of 7231.38 feet from the point of beginning and also being the point of commencement for the next parcel described immediately below;

Thence, continuing on the same course to the high water line of said Lake;

Thence, northwesterly along said high water line of said Lake to the POINT OF BEGINNING.

2.6.2 Northeast Shore Second Parcel

Beginning at a rebar set on the northeasterly shore of Chesuncook Lake on the easterly side of said Lease referred to immediately above at UTM coordinates of N 16684437.67, E 1566854.50 feet, and also being, South 64°26'20" East, a distance of 300.00 feet from the point of commencement described immediately above;

Thence, easterly along said Lease Line, North 50°22'50" East, a distance of 125.07 feet to a rebar set; Thence, continuing on the same course to a point that is 250.00 feet from the high water line of said Lake; Thence, southeasterly along a line that is always

250.00 feet from said high water line of said Lake to the Division Line near the middle of T3 R12 WELS;

Thence, southerly along said Division Line to a rebar set at the high water line of said Lake on a

blazed and painted line being, South 49°22'40" East, a distance of 8779.76 feet from the point of beginning described immediately above;

Thence, continuing along said Town Line to the high water line of said Lake; Thence, continuing northwesterly along the high water line of said Lake;

Thence, North 50°22'50" E, approximately 50 feet to the POINT OF BEGINNING.

2.6.3 South Shore Parcel

Beginning at a rebar set at where the shores of Caribou and Chesuncook Lake meet in the northeast quarter of Caribou Lake at UTM coordinates of N 16667251.82, E 1563250.34 feet

Thence, northerly, easterly, and southerly along said high water line of Chesuncook Lake to the Division Line near the middle of T3 R12 WELS;

Thence, continuing southerly on the said Division Line to a point that is 250.00 feet from the high water line of said Lake; Thence, northerly, westerly, and southerly along a line that is always 250.00 feet from said high water line of said Lake; Thence, at right angles to the shore of said Lake Westerly to the POINT OF BEGINNING.

Excepting a parcel of leased land described as follows:

Beginning at a rebar found at the southwest corner of a lease being, North 07°59'30" East, a distance of 10804.05 feet from the point of beginning described immediately above, and also at UTM coordinates of N 16677950.97, E 1564752.25 feet;

Thence, along said lease, North 74°57'10 East, a distance of 143.91 feet to a rebar found;

Thence, continuing along said lease, North 75°03'00" East, a distance of 25.90 feet to the northwest corner of a second lease; Thence, along said second lease, South 34°35'30" East, a distance of 186.26 feet to a rebar found; Thence, continuing, North 58°52'00" East, a distance of 149.47 feet to a rebar found near the shore, Thence, continuing on the same course to the high water line of said Lake;

Thence, continuing westerly and southerly along the high water line of said Lake; Thence, North 74° 57' 10" East, to the POINT OF BEGINNING.

2.6.4 West Shore Parcel

Beginning at a cedar post found and rebar set on the West shore of Chesuncook Lake on the Division Line near the middle of T3- R12 WELS at UTM coordinates of N 16678721.42, E 1573518.49 feet; Thence, southerly along said Town Line to a point that is

250.00 feet from the high water line of said Lake;

Thence, northerly along a line that is always 250.00 feet from said high water line of said Lake to said Division Line;

Thence, southerly along said Line to a rebar set on the shore of said Lake, being North 02°23'00" West, a distance of 4327.45 feet from the point of beginning described immediately above;

Thence, southerly along said high water line of said Lake to the POINT OF BEGINNING. 2.6.5 West Shore Second Parcel (intentionally omitted)

2.6.6 Islands

Together with two islands with coordinates as follows:

# Northings Eastings

1 16680985.55 1570808.69 rebar set

2 16681735.28 1568909.56 rebar set

2.7 T4 R12 Chesuncook Lake Area

One certain parcel of land on the East shore of Chesuncook Lake in Township T4 R12 WELS being a strip of land 250.00 feet wide extending from the High Water Line at an elevation of 941.59 MSL of said water bodies landward and to a line at all times 250.00 feet from said high water line of said water body, more particularly described as follows:

2.7.1 East Shore Chesuncook Lake

Beginning at a cedar post found and rebar set on the easterly shore of Chesuncook Lake on the Town Line between T4-R12 and T5-R13 WELS at UTM coordinates of N 16725505.34, E 1551478.87 feet; Thence, easterly along said Town Line to a point that is

250.00 feet from the high water line of said Lake; Thence, southerly along a line that is always 250.00 feet from said high water line of said Lake to the Town Line between T4-R12 and T3-R12 WELS;

Thence, westerly along said Town Line to a cedar post found and a rebar set, being, South 16°03'10" East, a distance of 37031.77 feet from the point of beginning described immediately above;

Thence, northerly along said high water line of said Lake to the point of beginning.

2.8 T4-R13 Chesuncook Lake Area

Three certain parcels of land on the West shore of Chesuncook Lake in Township T4-R13 WELS being a strip of land 250.00 feet wide extending from the High Water Line at an elevation of 941.59 MSL of said water bodies landward and to a line at all times

250.00 feet from said high water line of said water body.

2.8.1 West Shore Chesuncook Lake

Beginning at a cedar post found and rebar set on the westerly shore of Chesuncook Lake on the Town Line between T4-R13 and T3-R13 WELS at UTM coordinates of N 16689911.15, E 1553254.88 feet; Thence, westerly along said Town Line to a point that is 250.00 feet from the high water line of said Lake;

Thence, northerly along a line that is always 250.00 feet from said high water line of said Lake to a developed lease;

Thence, along said lease, South 73°38'50 East, a distance of approximately 240 feet to a rebar set 10 feet from the high water line, said rebar being, North 06°13'50" West, a distance of 6127.58 feet from the point of beginning and also being the point of commencement for the next parcel described immediately below;

Thence, continuing to the high water line of said Lake;

Thence, southerly along said high water line of said Lake TO THE POINT OF BEGINNING.

2.8.2 To the Patterson Parcel

Beginning at a rebar set on the westerly shore of Chesuncook Lake at UTM coordinates of N 16696194.44, E 1552646.14 feet, also being, North 16°21'10" East, a distance of 200.00 feet from the point of commencement described immediately above; Thence, North 73°38'50" West, to a point that is 250.00 feet from the high water line of said Lake; Thence, northerly along a line that is always 250.00 feet from said high water line of said Lake to the Patterson Parcel so called;

Thence, along said Parcel, to a rebar set 10 feet from the high water line, said rebar being, North 22°42'00" West, a distance of 24630.55 feet from the point of beginning and also being the point of commencement for the next parcel described immediately below;

Thence, continuing to the high water line of said Lake;

Thence, southerly along said high water line of said Lake to the point of beginning.

2.8.3 Patterson Parcel to the Chesuncook Village Parcel

Beginning at an iron pipe found at the northeast corner of the so called Patterson Parcel on the westerly shore of Chesuncook Lake at UTM coordinates of N 16720624.55, E 1543381.95 feet, also being, North 08°02'20" East, a distance of 1724.56 feet from the point of commencement described immediately above;

Thence, northwesterly along said Patterson Parcel to a point that is 250.00 feet from the high water line of said Lake;

Thence, northerly along a line that is always 250.00 feet from said high water line of said Lake to the Town Line between T4-R13 and T5-R13 WELS;

Thence, easterly along said Town Line to a cedar post found and a rebar set on the shore of said Lake, being, North 22°38'10" West, a distance of 5329.23 feet from the point of beginning described immediately above.

Thence, continuing to the high water line of said Lake;

Thence, continuing southerly along the high water line of said Lake;

Thence, westerly along the Patterson Parcel to the POINT OF BEGINNING described immediately above.

2.9 T5-R13 Chesuncook Lake Area

Seven parcels of land on the shore of several Lakes and Ponds in Township T5-R13 WELS being a strip of land 250.00 feet wide extending from the High Water Line at an elevation of 941.59 MSL of said water bodies landward and to a line at all times 250.00 feet from said high water line of said water body.

2.9.1 East Shore Umbazooksus Cove

Beginning at a cedar post found and rebar set on the easterly shore of Umbazooksus Cove on the Town Line between T6-R13 and T5-R13 WELS at UTM coordinates of N 16757386.00, E 1548447.54 feet; Thence, easterly along said Town Line to a point that is

250.00 feet from the high water line of said Lake; Thence, southerly along a line that is always 250.00 feet from said high water line of said Cove to the Town Line between T5-R12 and T5-R13 WELS;

Thence, southerly along said Town Line to a cedar post found and a rebar set, being, South 16°51'00" East, a distance of 14950.65 feet from the point of beginning described immediately above, and also being the point of commencement for the next parcel described immediately below;

Thence, northerly along said high water line of said Cove to the POINT OF BEGINNING.

Subject to a 100.00 foot wide right-of-way for an existing haul road and its westerly bounds described as follows:

Beginning at a point 50.00 feet westerly of the centerline of said existing haul road, being, North 89'48'10" East, a distance of 340.32 feet from the point of beginning described immediately above; Thence, continuing 50.00 feet westerly from the centerline of said road, South 43°31'10" West, a

distance of 310.72 feet to a rebar set;

Thence, continuing, South 05°03'10" West, a distance of 419.72 feet to a rebar set; Thence, continuing, South 14°00'40" West, a distance of 460.58 feet to a rebar set;

Thence, continuing along a line that is always 50.00 feet westerly of the center line of the existing haul road to the point where it is

250.00 feet from the high water line of Umbazooksus Cove and the end of this exception.

2.9.2 East Shore Moose Pond

Beginning at a rebar set on a blazed line found on the easterly shore of Moose Pond on the Town Line between T 5-R12 and T5- R13, at UTM coordinates of N 16735732.68, E 1552836.28 feet, being, South 00°25'40" East, a distance of 7344.81 feet from the point of commencement described immediately above;

Thence, southerly along said Town Line to a point that is 250.00 feet from the high water line of said Pond;

Thence, southerly along a line that is always 250.00 feet from said high water line of said Pond to the Town Line between T5-R12 and T5-R13 WELS;

Thence, southerly along said Town Line to a cedar post found and a rebar set, being, South 00°00'10" West, a distance of 4884.39 feet from the point of beginning described immediately above, and also being the point of commencement for the parcel described immediately below;

Thence, northerly along said high water line of said Pond to the POINT OF BEGINNING.

2.9.3 East Shore of Chesuncook Lake

Beginning at a rebar set on a blazed line found on the easterly shore of Chesuncook Lake on the Town Line between T 5-R12 and T5-R13 at UTM coordinates of N 16,729,028.57, E 1,552,815.58 feet, being, South 00°38'30" West, a distance of 1819.83 feet from the point of commencement described immediately above;

Thence, southerly along said Town Line to a point that is 250.00 feet from the high water line of said Lake;

Thence, southerly along a line that is always 250.00 feet from said high water line of said Lake to the Town Line between T5-R13 and T4-R12 WELS;

Thence, westerly along said Town Line to a cedar post found and a rebar set, being, South 20°46'40" West, a distance of 3768.29 feet from the point of beginning described immediately above, and also being the point of commencement described immediately below;

Thence, northerly along said high water line of said Lake to the POINT OF BEGINNING.

2.9.4 West Shore of Chesuncook Lake and South Shore of the West Branch of the Penobscot River

Beginning at a rebar set on a painted and blazed line on the North bound of Chesuncook Village so called and at UTM coordinates of N 16735672.99, E 1534727.53 feet and being, North 58°44'40" West, a distance of 19595.63 feet from the point of commencement described immediately above;

Thence, westerly along the northerly bound of said Village to a point that is 250.00 feet from the high water line of said Lake; Thence, northerly and westerly along a line that is always 250.00 feet from said high water line of said Lake and continuing along the southerly high water mark of the West Branch of the Penobscot River to the Town Line between T5-R13 and T5-R14 WELS Thence, northerly along said Town Line to a cedar post found and a rebar set on the southerly shore of said

River, being, South 73°00'50" West, a distance of 14563.60 feet from the point of beginning described immediately above, and also being the point of commencement for the parcel described below;

Thence, easterly along said high water line of said River and Lake to POINT OF BEGINNING.

2.9.5 North Side of the Penobscot River around to Brandy Pond

Beginning at a rebar set on a blazed line found on the northerly shore of the West Branch of the Penobscot River on the Town Line between T5-R13 and T5-R14 at UTM coordinates of N 16732048.88 E 1520813.86 feet being, North 01°19'00" East, a distance of

630.96 feet from the point of commencement described immediately above;

Thence, northerly along said Town Line to a point that is 250.00 feet from the high water mark of said River;

Thence, easterly, northerly, westerly, and northerly along a line that is always 250.00 feet from said high water line of said River, along the westerly shore of Chesuncook Lake and then along the South and West shore Brandy Pond to the Town Line also between T5-R13 and T5-R14 WELS;

Thence, northerly along said Town Line to a rebar set on the westerly shore of Brandy Pond, being, North 00°30'50" East, a distance of 8646.16 feet from the point of beginning described immediately above, and also being the point of commencement for the next parcel described immediately below;

Thence, southerly, easterly, southerly and westerly along the high water line of said bodies of water to the POINT OF BEGINNING.

2.9.6 Brandy Pond to Black Pond

Beginning at a rebar set on a blazed line found on the westerly shore of Brandy Pond on the Town Line between T5-R13 and T5- R14 at UTM coordinates of N 16741409.48, E 1520867.50 feet being, North 01°54'50" West, a distance of 715.19 feet from the point of commencement described immediately above;

Thence, northerly along said Town Line to a point that is 250.00 feet from the high water line of said Pond;

Thence, northerly, easterly, and northerly along a line that is always 250.00 feet from said high water line of said Pond continuing to Black Pond to the Town Line also between T5-R13 and T5-R14 WELS; Thence, northerly along said Town Line to westerly shore of Black Pond, being, North along said Town Line from the point of beginning described immediately above;

Thence, southerly, easterly, southerly and westerly along the high water line of said bodies of water to the POINT OF BEGINNING.

2.9.7 East Shore of Black Pond, to the North Shore of Chesuncook Lake, and to the West Shore of Umbazooksus Cove

Beginning at a rebar set on a blazed line found on the easterly shore of Black Pond on the Town Line between T5-R13 and T6-R13 at UTM coordinates of N 16757518.36, E 1524150.37 feet being, North 11°31'10" East, a distance of 16439.99 feet from the point of beginning described immediately above; Thence, easterly along said Town Line to a point that is 250.00 feet from the high water line of said Pond;

Thence, southerly, easterly, and northerly along a line that is always 250.00 feet from said high water line of said Pond continuing to and along the North shore of Chesuncook Lake and then continuing to and along the West shore to Umbazooksus Cove and to the Town Line between T5-R13 and T6-R13 WELS;

Thence, easterly along said Town Line to the westerly shore of Umbazooksus Cove and a rebar set and cedar post found, being, North 89°57'50" East, a distance of 20908.17 feet along said Town Line from the point of beginning described immediately above, and also being the point of beginning for the course described immediately below;

Thence, southerly, westerly, northerly and westerly along the high water line of said bodies of water to the POINT OF BEGINNING.

2.9.8 Reserved

2.9.9 Islands

Whether or not described elsewhere herein, together with all islands, except Islands listed in Schedule 3 attached hereto and except Gero Island, and including in this grant without limitation four (4) islands identified by the following UTM coordinates in feet:

Northings Eastings

#1 16741763.14 1521926.39 Rebar set

#2 16730226.03 1523953.91 Rebar set

#3 16729413.24 1524757.24 Rebar set

#4 16738200 1523200.

2.10 T5-R14 Brandy and Black Ponds Area

Certain parcels of land on the shore of Brandy and Black Ponds in Township T5-R14 WELS being a strip of land 250.00 feet wide extending from the High Water Line at an elevation of 941.59 MSL of said water bodies landward and to a line at all times 250.00 feet from said high water line of said water body, more particularly described as follows:

2.10.1 West Shore of Black Pond

Beginning on a blazed and painted line and a rebar set on the westerly shore of Black Pond on the Town Line between T6-R14 and T5-R14 WELS at UTM coordinates of N 16757466.19, E 1520717.25 feet; Thence, southerly along the high water line of said Pond to the Town Line between T5-R14 and T5-R13; Thence, southerly along said Town Line to a point that is 250.00 feet from the shore of said Pond; Thence, northerly along a line that is always 250.00 feet from said high water line of said Pond to the Town Line between T5-R14 and T6-R14 WELS;

Thence, easterly along said Town Line to the point of beginning.

2.10.2 West Shore of Brandy Pond

Beginning on a blazed and painted line and a rebar set on the westerly shore of Brandy Pond on the Town Line between T5-R13 and T5-R14 WELS at UTM coordinates of N 16740694.69, E 1520891.40 feet;

Thence, southerly along said Town Line to a point that is 250.00 feet from the shore of said Pond; Thence, northerly along a line that is always 250.00 feet from said high water line of said Pond crossing Brandy Brook to the Town Line between T5-R14 and T5- R13 WELS;

Thence, southerly along said Town Line again crossing Brandy Brook to the high water line of said Pond; Thence, southerly along the high water line of said Pond to the Town Line between T5-R14 and T5-R13 and the point of beginning.

2.11 T6-R13 Black Pond and Umbazooksus Cove

Certain parcels of land on the shore of Black Pond and Umbazooksus Cove in Township T6-R13 WELS being a strip of land

250.00 feet wide extending from the High Water Line at an elevation of 941.59 MSL of said water bodies landward and to a line at all times 250.00 feet from said high water line of said water body.

2.11.1 East Shore Black Pond

Beginning at a cedar post found and rebar set on the northeasterly shore of Black Pond on the Town Line between T6-R13 and T6- R14 WELS at UTM coordinates of N 16763431.26, E 1,521,114.43 feet; Thence, northerly along said Town Line to a point that is

250.00 feet from the high water line of said Pond;

Thence, southerly along a line that is always 250.00 feet from said high water line of said Pond to the Town Line between T6-R13 and T5-R13 WELS;

Thence, westerly along said Town Line to a cedar post found and a rebar set, being, South 27°10'40" East, a distance of 6646.75 feet from the point of beginning described immediately above, and also being the point of commencement for the next parcel described immediately below;

Thence, northerly, along said high water line of said Pond to the point of beginning.

2.11.2 Umbazooksus Cove

Beginning at a cedar post found and rebar set on the westerly shore of Umbazooksus Cove on the Town Line between T6-R13 and T5-R13 WELS at UTM coordinates of N 16757531.81, E 1545058.54 feet being, North 89°57'50" East, a distance of 20908.17 feet from the point of commencement described above in Section 2.9.7;

Thence, westerly along said Town Line to a point that is 250.00 feet from the high water line of said Lake;

Thence, northerly along a line that is always 250.00 feet from said high water line of said Cove to a point on the westerly shore of Umbazooksus Stream that is also the Point of Beginning for the Umbazooksus connector so called;

Thence, easterly along said Connector to the intersection of the easterly high water line of said Connector and 250.00 feet from the high water line of Umbazooksus Cove;

Thence, easterly and southerly along a line that is always 250.00 feet from said high water line of said Cove to the Town Line between T6-R13 and T5-R13 WELS;

Thence, westerly along said Town Line to the high water line of said Lake;

Thence, northerly, westerly and southerly along said high water line of said Cove to the POINT OF BEGINNING.

Subject to a 100.00 foot wide right-of-way for an existing haul road as now exists and its westerly bounds described as follows: Beginning at a point 50.00 feet westerly of the centerline of said existing haul road being, North 89°48'10" East, a distance of

340.32 feet from the point of commencement described above in Section 2.9.1;

Thence, continuing 50.00 feet westerly from the centerline of said road, North 43°31'10" East, a distance of 77.70 feet to a rebar set;

Thence, continuing, North 50°02'00" East, a distance of 301.56 feet to a rebar set; Thence, continuing, North 23°59'50" East, a distance of 173.58 feet to a rebar set; Thence, continuing, North 10°47'20" East,

a distance of 612.25 feet to a rebar set; Thence, continuing, North 08°09'50" East, a distance of 785.31 feet to a rebar set; Thence, continuing, North 05°36'00" East, a distance of 117.62 feet to a rebar set; Thence, continuing, North 08°21'50" East, a distance of 496.43 feet to a rebar set; Thence, continuing, North 05°23'00" East, a distance of 304.21 feet to a rebar set;

Thence, continuing along a line that is always 50.00 feet westerly of the center line of the existing haul road to the point where it is

250.00 feet from the high water line of Umbazooksus Cove and the end of this exception.

Excepting a certain parcel of leased land on the easterly shore of the water connector between Umbazooksus Cove and Umbazooksus Lake on the northerly side of the Longley Stream Road so called in Township T6-R13 WELS as follows:

Beginning at a rebar set on the easterly shore of the connector stream and the northerly side of the Longley Stream Road at UTM coordinates of North 16762616.75, East 1548442.53 feet;

Thence, westerly along said Road to the Umbazooksus Stream; Thence, northeasterly along said Stream;

Thence, South 73°13'30" East, to a rebar set that is, North 08°05'00" East, a distance of 200.00 feet from the last rebar set; Thence, continuing on the same course, a distance of 244.81 feet to a rebar set;

Thence, South 08°05'00" West, a distance of 30 feet more or less to the side of said Road;

Thence, southwesterly along said Road to the POINT OF BEGINNING. Said parcel of land containing approximately 0.65 acres.

The above described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham, PLS #1027. Coordinates are UTM feet Census Datum, Zone 19 North. Location Control by Trimble XL Pro GPS, with a minimum of 600 observations.

2.12 Ragged Lake

The land and interests in land, including, without limitation, the dam and dam structures, including a boat launch facility and campground situated in Township T2 R 13 WELS, County of Piscataquis, State of Maine being part of the land now or formerly owned by GNP, and being bounded and described more particularly as follows:

BEGINNING at a painted masonry nail set into the concrete abutment, on the northerly side of Ragged Lake Dam structure, located at UTM coordinate 16,634,366.36 North and 1,555,601.87 East, as acquired by G.P.S.;

Thence, northerly and northwesterly along the high water mark of Ragged Lake, at an elevation equal to the N.F.P.E. of 1135 feet MSL U.S.G.S. datum to the southwest corner of L-3601, a camp lot now or formerly leased to Thomas W. Varney;

Thence, along said L-3601, a UTM Grid bearing of, North 39°04'40" East, a distance of 10 feet to a #5 rebar set and capped #1027, located at UTM coordinate 16,634,556.41 North and 1,555,496.02 East, also being a tie-line bearing of, North 29°07'00" West, and a distance of 217.54 feet from above mentioned masonry nail;

Thence, continuing along said L-3601, North 39°04'40" East, a distance of 61.90 feet to the southeast corner of said Lot, and a rebar set;

Thence, across the source parcel, North 25°08'20" East, a distance of 244.89 feet to a rebar set;

Thence, continuing, South 56°49'10" East, a distance of 496.1 1 feet to a rebar set, being

approximately 10 feet westerly of the shoulder of a road;

Thence, South 27°03'40" East, a distance of 99.94 feet to a rebar set, being approximately 10 feet westerly of the shoulder of a road;

Thence, South 33°50'00" West, a distance of 1466.60 feet to a rebar set;

Thence, continuing, North 64°37'20" West, a distance of 551.93 feet to a rebar set; Thence, continuing, North 30°40'50" West, a distance of 263.00 feet to a rebar set; Thence, continuing, North 29°07'10" East, a distance of 252.00 feet to a rebar set;

Thence, continuing to the Shore of Ragged Lake, North 29°07'10" East, a distance of 15 feet;

Thence, southeasterly and northeasterly along the high water mark of Ragged Lake, at an elevation equal to the N.F.P.E. of 1135 MSL U.S.G.S. datum, a distance of approximately 1592 feet to a painted nail set into the southwest concrete abutment of the Ragged Lake Dam, being on a tie line bearing of, North 65°49'20" East, and a distance of 910.71 feet from the last mentioned rebar set;

Thence, North 01°41'30" West, a distance of 63.08 feet to the point of beginning. The above described parcel of land containing

15.0 acres.

The above described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham, PLS #1027, and shown on a Plat having a revised date of August 11, 1999. All bearings calculated from UTM Grid, NAD27 Conus datum, Zone 19 North. UTM coordinates are expressed in feet. Location Control by Trimble Pro XL GPS, with a minimum of 600 observations. Expected repeatability is 1.0 feet, Ground traverse was performed with an EDM. All monuments set are 5/8 inch metal rebar with yellow plastic caps affixed to them, with "D. Bridgham, PLS # 1027" imprinted in the caps.

TOGETHER WITH:

i. Ragged Lake Dam and the dam structures.
ii. All of the land that lies between the high water mark of Ragged Lake which high water mark is at an elevation equal to the N.F.P.E. of 1135 feet MSL U.S.G.S. datum and a line lying ten feet horizontally outside of said high water mark of Ragged Lake.
iii. All islands within Ragged Lake, excepting, however, the portion of Ragged Lake Island that lies above said line lying ten feet horizontally outside of said high water mark of Ragged Lake.
iv. Ragged Lake and the bed of Ragged Lake.
v. All lands upstream of the Ragged Lake Dam that have been flowed by the dam.
vi. All flowage rights, whether acquired by Legislative Charter, by deed, by prescription or otherwise, over lands located upstream or downstream of the dam that, historically or currently, have been flowed or flooded by the Ragged Lake Dam.
vii. A flowage easement for flowage of any of the lands herein conveyed, upstream or downstream of the Ragged Lake Dam, that may from time to time be flowed or flooded in the future by the Ragged Lake Dam to the extent that such lands historically or currently have been flowed or flooded by this dam and provided that such flowage easements for land upstream of the dam will not extend further than 1138.8 MSL U.S.G.S. datum.

The interests described in paragraphs (i) through (vii) affect property situated in T2 R13 WELS and T3 R13 S/2 WELS.

2.13 Caribou Lake Boat Launch

A certain Parcel of land being in Township 2, Range 12 WELS in the County of Piscataquis, State of Maine, described as follows: Beginning at a rebar set at UTM coordinates of North 16,652,552 feet, East 1,560,162 feet, on the easterly side of the Golden Road approximately 200 feet southerly of the

existing boat launch and camping site;

Thence, along said Golden Road, North 01°58'10" West, a distance of 406.27 feet to a rebar set at UTM coordinates of North 16,652,958 feet, East 1,560,148 feet;

Thence, North 88°01'50 East, a distance of 115 feet more or less to the high water line of Caribou Lake; Thence, along said high water line southerly with a tie-line of, South 9°40'50" East, a distance of 409.98 feet;

Thence, South 88°01'50" West, a distance of 170.00 feet more or less to the point of beginning. Said Parcel of land containing approximately 1.33 acres.

Also, granting an easement for the use, repair, maintenance and improvement of any portion of the boat launch facilities that may fall below the normal high water line of said Caribou Lake.

2.14 Caribou Lake Recreation Area No. 3

A certain Parcel of land being a parcel of land now or formerly owned by Great Northern Paper, Inc. in Township 3, Range 12 WELS in the County of Piscataquis, State of Maine, described as follows: Beginning at a rebar set on the northerly shore of Caribou Lake on a blazed line painted yellow at UTM coordinates of North 16,672,972, East 1,557,837;

Thence along said blazed and painted line, South 88°28'10" East, a distance of 2469.88 feet to a rebar set on the Westerly shore of Chesuncook Lake at UTM coordinates of North 16,672,906, East 1,560,306; Thence, continuing easterly to the high water line of said Lake;

Thence, continuing in a southerly direction along the high water line of Chesuncook Lake to a lease; Thence, South 66°49'30" West, to a rebar set, also being on a tie line bearing of, South 11°33'50" East, a distance of 694.28 feet from the above mentioned rebar set;

Thence, continuing, South 66°49'30" West, a distance of 560.69 feet to a rebar set on the northerly shore of Caribou Lake; Thence, continuing, South 66°49'30" West, to the high water line of said Lake;

Thence, continuing generally in a westerly direction along the high water line of Caribou Lake to a division line;

Thence, South 88°28'10 East, to the Point of Beginning, also being on a tie line bearing of, North 65°12'10" West, a distance of 2305.29 feet from the last mentioned rebar set.

Said Parcel of land containing approximately 38 acres above the high water line.

The above described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham, PLS #1027, and shown on a Plat dated August 30, 2001; as revised through May 30, 2002.

All bearings are calculated from UTM observations. All monuments set were 5/8 inch metal rebar with yellow plastic caps affixed to them, with "D. Bridgham, PLS #1027" imprinted in the caps.

2.15 T3 R12 WELS - Reserved.

2.16 Weymouth point, Chesuncook Lake Recreation Area No. 2

A certain parcel of land, now or formerly owned by GNP in Township 4, Range 12 WELS in the County of Piscataquis, State of Maine, described as follows:

Beginning at a rebar set at the high water line on the easterly shore of Chesuncook Lake at UTM coordinates of North 16,696,693, East 1,557,917;

Thence, easterly along said high water line to an estimated location being on a tie line of, North

69°00'10" East, a distance of 1175.20 feet;

Thence, along said estimated line, South 0°00'00" East, a distance of 3800.00 feet to the high water line of said Lake being, North 49°18'40" West, a distance of 45.00 feet from a rebar set at UTM coordinates of North 16,693,285, East 1,559,048;

Thence, northerly and then easterly along said shore of Chesuncook Lake to the point of beginning, being on a tie line of, North 17°59'20" West, a distance of 3552.55 feet. Said parcel of land containing approximately 106 acres above the high water line.

The above described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham, PLS #1027, and shown on a Plat dated August 31, 2001. All bearings are calculated from UTM observations. All monuments set were 5/8 inch metal rebar with yellow plastic caps affixed to them, with "D. Bridgham, PLS #1027" imprinted in the caps.

2.17 Chesuncook Dam

A certain Parcel of land, including, without limitation, the dam and dam structures, being a parcel of land now or formerly owned by GNP, known as the Chesuncook Dam Lot, in Township 3, Range 12 WELS, in the County of Piscataquis, State of Maine.

Described more particularly as follows:

Beginning on the 1903 high water mark of Chesuncook Lake, as shown on an unpublished plan entitled "Map of a Parcel of Land in Township No. 3 Range 12, Piscataquis County, Maine at outlet of Lake Chesuncook", "Dated July 1903, Retraced July 1908" File No. 519A, in the possession of KPC;

Thence, North 36°58'40" East, a distance of 150 feet, more or less, to a point approximately in line with the center of the old dam; Thence, continuing on the same course, North 36°58'40" East, 400 feet;

Thence, crossing the West Branch of the Penobscot River, South 53°01'20" East, a distance of 2000 feet; Thence, along a Plan entitled "Subdivision Plan for Webber Timberlands in T3 R12 WELS" by Prentiss and Carlisle Management Co. Inc. dated January 10, 1990, South 36°58'40" West, a distance of 310 feet, more or less, to an iron pin, found, capped #1050;

Thence, continuing along the same course, South 36°58'40" West, a distance of 395.42 feet to a painted cross on a rock;

Thence, continuing along the same course, South 36°58'40" West, a distance of 154 feet, more or less, to the 1903 low water mark of Chesuncook Lake;

Thence, generally northwesterly along the 1903 low water mark of Chesuncook Lake, to a point that is South 36°58'40" West, a distance of 182 feet, more or less, from the point-of-beginning;

Thence, North 36°58'40" East, a distance of 182 feet, more or less, to the POINT-OF BEGINNING.

The tie course from said painted cross to the point-of-beginning having a bearing of, North 48°35'30" West, a distance of 2006.00 feet. The above described parcel of land containing approximately 29 acres. The above described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham, PLS #1027, and shown on a Plat dated August 31, 2001. All bearings are calculated from UTM observations. All monuments set were 5/8 inch metal rebar with yellow plastic caps affixed to them, with "D. Bridgham, PLS #1027" imprinted in the caps.

2.18 Harrington Lake Dam Easement

An exclusive Hydroelectric Easement (as defined in Section 15), located upon, over, under, through and across the following described parcel:

A certain Parcel of land situated in Township 4, Range 11 WELS, County of Piscataquis, State of Maine, being part of land now or formerly owned by GNP. Bounded and described more particularly as follows: Beginning at a U.S.G.S. Benchmark set into the southerly wing of the Dam, with a listed elevation of 1036.00 feet, located at UTM coordinate 16,692,945.54 North and 1,591,423.08 East;

Thence, along the shore of Harrington Lake, at an elevation equal to a N.F.P.E. of 1036 feet U.S.G.S. datum in a generally southerly direction to a #5 rebar set approximately 25 feet from the high water mark of the Lake, being on a tie-line bearing of South 16°24'20" East, and a distance of 471.28 feet from the above mentioned benchmark;

Thence, South 84°48'00" West, a distance of 293.76 feet to a rebar set; Thence, North 07°16'10" West, a distance of 1028.37 feet to a rebar set; Thence, North 21°25'50" East, a distance of 947.13 feet to a rebar set;

Thence, South 49°49'20" East, a distance of 302.12 feet to a rebar set approximately 20 feet from the shore, and located at UTM coordinate N 16,694,173.66, E 1,591,710.38 feet;

Thence, along the shore of Harrington Lake, at an elevation equal to a N.F.P.E. of 1036 feet U.S.G.S. datum, in a generally southerly direction to the point of beginning, being on a tie-line bearing of, South 13°10'00" West, and a distance of 1261.28 feet from the last mentioned rebar set. The above described parcel containing 9.5 acres more or less.

The above described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham PLS #1027, and shown on a Plat, having a revised date of January 29, 2002. All bearings are calculated from UTM Grid, Nad27, Conus Datum, Zone 19 North. UTM coordinates are expressed in feet. Location control by Trimble XL Pro GPS, with a minimum of 600 observations. The mean of the standard deviations is 0.91 feet. Ground traverse was performed by EDM. All monuments set are 5/8 inch metal rebar with yellow plastic caps affixed to them with "D. Bridgham, PLS # 1027" imprinted in the caps.

Together with flowage rights in T4 R11 and T3 R11 and all flowage rights, whether acquired by Legislative Charter, by deed, by prescription or otherwise, over lands located upstream or downstream of the dam that, historically or currently have been flowed or flooded by Harrington Lake Dam.

2.19 Ripogenus Dam Lot and McKay Station

A certain parcel of land including, without limitation, the dam and dam structures, situated in the Township 3 Range 11 WELS of the County of Piscataquis, State of Maine being part of the land now or formerly owned by Great Northern Paper, Inc. Bounded and described more particularly as follows:

Beginning on the northerly side of Ripogenus Impoundment at UTM coordinates of North 16,669,093.79, East 1,595,119.81, also being, North 29°00'20" West, a distance of 930.20 feet from a brass disk found stamped B82-1942 near the southerly end of the concrete dam at UTM coordinates of North 16,668,280.27, East 1,595,570.86;

Thence, easterly, North 78°36'50" East, a distance of 475.13 feet to a rebar set;

Thence, continuing southerly, South 16°14'20" East, a distance of 30.00 feet to a rebar set;

Thence, North 78°18'50" East, a distance of 351.98 feet to a rebar set on the northerly side of a former wood sluice;

Thence, continuing easterly approximately 20.00 feet northerly from said sluice for the next several courses, North 87°03'10" East, a distance of 260.27 feet to a rebar set;

Thence, continuing, South 85°37'30" East, a distance of 412.09 feet to a rebar set; Thence, continuing, South 63°09'00" East, a distance of 184.13 feet to a rebar set; Thence, continuing, South 60°04'10" East, a distance of 570.35 feet to a rebar set; Thence, continuing, South 65°34'00" East, a distance of

1356.12 feet to a rebar set; Thence, continuing, South 79°45'30" East, a distance of 547.09 feet to a rebar set;

Thence, continuing, South 55°45'20" East, a distance of 391.60 feet to a rebar set and the end of the wooden sluice; Thence, crossing the West Branch of the Penobscot River, South 58°30'40" East, a distance of 1463.70 feet;

Thence, South 00°38'10" East, a distance of 500.00 feet to the high transmission lines to Millinocket;

Thence, continuing along same bearing, South 00°38'10" East, a distance of 200.00 feet to the easterly side of the Golden Road; Thence, westerly along said Golden Road with a tie line of, South 81°38'20" West, a distance of 1659.86 feet;

Thence, northerly, North 08°29'00" East, a distance of 1044.93 feet;

Thence, westerly, North 85°52'30" West a distance of 1030.53 feet to a rebar set on the southerly side of a tower supporting a siren;

Thence, continuing westerly, North 68°06'10" West, a distance of 2254.74 feet to a railroad spike set; Thence, southerly along a roadway, South 07°37'40" West, a distance of 222.73 feet;

Thence, continuing along a roadway, South 00°11'50" West, a distance of 226.27 feet;

Thence, continuing on the same bearing, South 00°11'50" West, approximately 840 feet to the northerly side of the Golden Road; Thence, westerly along the northerly side of the Golden Road to a point that is 250 feet measured perpendicularly, from the high water line of the Ripogenus Impoundment;

Thence, easterly and northerly along a line that is always 250 feet from said high water line to the land described in Section 2.5.2 herein at a point that is South 06°56'10" West from a point that is at or near the intersection of the high water line of said Ripogenus Impoundment and a line on a bearing North 84°44'00" West from a railroad spike;

Thence, North 06°56'10" East along said land described in Section 2.5.2 to such point at or near the high water line of the Ripogenus Impoundment, such point further described as being 50 feet, more or less, distant on a bearing North 84°44'00" West from a railroad spike;

Thence, continuing northerly to include all of the south shoreline west of the Dam Lot, North 06°56'10" East, a distance of 662.96 feet;

Thence, continuing northerly, North 19°42'30" East, a distance of 854.86 feet to the Point of Beginning. The area within the traverse is 175 acres, more or less.

TOGETHER WITH a 4160 volt transmission line extending from McKay Station to Ripogenus Dam as shown on the Plat of the subject parcel.

The above parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham, PLS #1027, and shown on a Plat dated August 31, 2001, as revised through May 22, 2002. All bearings are calculated from UTM Grid, NAD 27 Conus datum, Zone 19 North. UTM coordinates are expressed in feet. Location Control by Trimble XL Pro GPS, with a minimum of 600 observations. Expected repeatability is 1.0 feet. Ground traverse was performed with an EDM. All monuments set were 5/8 inch metal rebar with yellow plastic caps affixed to them, with "D. Bridgham, PLS#1027" imprinted in the caps.

2.20 Big Eddy Siren Easement

An easement to construct, maintain and operate a siren tower, including an easement for ingress and egress across lands now or in the future owned by KPC or KT, or their successors or assigns, located upon a certain parcel of land situated in Township 3 Range 11, County of Piscataquis, State of Maine

being known as the Big Eddy Siren, also being part of the land now or formerly owned by GNP Bounded and described more particularly as follows:

BEGINNING at the Big Eddy Siren Tower, located at approximate UTM coordinates North 16,666,820 feet, East 1,606,264 feet, as estimated by GPS;

Thence, in a circle around the tower, having its center at the center of the existing tower as aforementioned, having a radius of 25 feet.

The above described parcel containing an area of 0.04 Acres.

The above described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham, PLS #1027, and shown on a Plat dated "Published August 29, 2001". Coordinates are UTM feet Conus Datum, Zone 19 North. Location Control by Trimble XL Pro GPS, with a minimum of 600 observations. Mean Horizontal Precision is 0.75 feet.

2.21 Holbrook Side Channel Easement

An easement over, under or through the following described parcel, for all purposes required to satisfy Federal Energy Regulatory Commission ("FERC") license obligations under Article 406 of the Ripogenus Project that such parcel be operated and maintained as a fisheries enhancement project area:

A certain parcel of land situated in the Township 3 Range 11, County of Piscataquis, State of Maine being known as the Holbrook Side Channel Lot, also being part of the land now or formerly owned by GNP Bounded and described more particularly as follows: BEGINNING at a #5 rebar set and capped # 1027, located at UTM coordinate 16,666,868.81 North and1,603,013.82 East, as acquired by GPS;

Thence, across the source parcel, a UTM Grid bearing of, North 05°23'10" East, a distance of 297.37 feet to a rebar set located at UTM coordinate 16,667,164.87 North, and 1,603,041.74 East;

Thence, continuing, North 14°35'40" West, a distance of 108.35 feet to a rebar set; Thence, continuing, North 24°09'20" East, a distance of 112.75 feet to a rebar set; Thence, continuing, North 82°13'00" East, a distance of 275.43 feet to a rebar set; Thence, continuing, North 85°31'10" East, a distance of 146.82 feet to a rebar set; Thence, continuing, North 78°55'00" East, a distance of 354.63 feet to a rebar set; Thence, continuing, North 52°14'00" East, a distance of 159.59 feet to a rebar set; Thence, continuing, North 82°30'50" East, a distance of 282.37 feet to a rebar set;

Thence, continuing, South 72°05'00" East, a distance of 466.16 feet to a rebar set on the northwesterly right-of-way of the Telos Road;

Thence, along said Telos Road, South 31°54'30" West, an approximate distance of 250 feet to the West Branch of the Penobscot River;

Thence, westerly along the River to a point being, South 05°23'10" West from the first mentioned rebar set;

Thence, North 05°23'10" East, an approximate distance of 60 feet to the POINT OF BEGINNING. The above described parcel of land containing 13.1 acres more or less.

The above described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham PLS # 1027, and shown on a Plat, dated November 19, 1999, Published August 30, 2001. All bearings are calculated from UTM Grid, NAD27 Conus Datum Zone 19 North. UTM coordinates are expressed in feet. Location Control by Trimble XL Pro GPS, with a minimum of 600 observations. Mean Horizontal Precision is 0.800 feet. Ground traverse was performed with an EDM. All monuments set were 5/8 inch metal rebar with yellow plastic caps affixed to them with "D. Bridgham PLS # 1027 " imprinted in the caps.

2.22 Pockwockamus Take Out Easement

An easement for recreational purposes over, under or through a certain parcel of land situated in T2 R10, County of Piscataquis, State of Maine being part of what is known as Nevers Corner, also being part of the land now or formerly owned by GNP. Bounded and described more particularly as follows:

Beginning at a 1" solid pin found, 12" above the ground, located at UTM 16,643,534.70 feet North and 1,653,192.88 East, as acquired by GPS, also having a UTM Grid tie-line bearing of South 63°23'10"East, and a distance of 246.40 feet to a yellow painted cedar post dividing T2 R10 and T2 R9;

Thence, South 42°58'10" West, a distance of 526.07 feet to a 1" solid pin found 12" above ground level, located at 16,643,149.77 North and 1,652,834.30 East, as acquired by GPS;

Thence, continuing, South 42°58'10" West, an approximate distance of 30 feet to the West Branch of the Penobscot River; Thence, in a generally westerly direction, along said River to a point being, South 42°58'10" West from a #5 rebar set and capped # 1027;

Thence, North 42°58'10" East, an approximate distance of 70 feet to a rebar set also being, North 52°31'50" West, a distance of

199.53 feet from the last iron rod found;

Thence, continuing, North 42°58'10" East, a distance of 495.30 feet to a 1" solid pin found 12" above ground level;

Thence, South 61°08'00" East, a distance of 204.79 to the point of beginning. The above described parcel of land containing 2.5 acres more or less.

Subject to an 80' right-of-way, the center of which being described by the Old Golden Road.

The above described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham, PLS #1027, and shown on a Plat, dated November 19, 1999, Published August 28, 2001. All bearings are calculated from UTM Grid, NAD27 Conus Datum Zone 19 North. UTM coordinates are expressed in feet. Location Control by Trimble XL Pro GPS, with a minimum of 600 observations. Mean Horizontal Precision is 0.336 feet. Ground traverse was performed with an EDM. All monuments set were 5/8 inch metal rebar with yellow plastic caps affixed to them with "D. Bridgham PLS #1027" imprinted in the caps.

2.23 Northeast Corner of T1 R9 - intentionally omitted

2.24 Great Northwoods, LLC Deed

Whether or not described elsewhere herein, together with the following Reserved Parcel Two described and reserved in deed from Great Northern Paper, Inc. to Great Northwoods, LLC dated March 30, 1999 and recorded in the Piscataquis County Registry of Deeds in Book 1191, Page 326:

Ripogenus Project (FERC No. 2572)

a. The land that lies between the high water marks of Chesuncook Lake, Black Pond, Brandy Pond, and the West Branch of the Penobscot River on both sides of said river from Chesuncook Lake upstream to the West Town Line of Township 5 Range 13 WELS, which high water marks are at an elevation equal to the N.F.P.E. of 941.59 feet MSL U.S.G.S. datum, and a line lying 250 feet horizontally outside- of said high water marks of said Chesuncook Lake, Black Pond, Brandy Pond, and the West Branch of the Penobscot River on both sides of said river from Chesuncook Lake upstream to the West Town Line of Township 5 Range 13 WELS.

b. All islands, except Islands listed on Schedule 3 attached hereto and except Gero Island, within the impoundment of the Ripogenus Project, being all islands within Chesuncook Lake, Black Pond, Brandy Pond, and so much of the West Branch of the Penobscot River that lies between

Chesuncook Lake upstream to the West Town Line of Township 5 Range 13 WELS.

c. The real estate located on the shores of Chesuncook Lake, Caribou Lake and Black Pond in T2 R12 WELS, T3 R12 WELS, T3 R13 WELS, and T6 R14 WELS (south half), reserved under deed from Great Northern Nekoosa Corporation to Barbara A. Cassidy, et al., dated December 16, 1988 and recorded in the PCRD in Book 708, Page 174, more fully described in Schedule A thereto, paragraphs Fourth, Fifth, Seventh, Eighth, and Tenth, respectively.

d. All flowage rights, whether acquired by Legislative Charter, by deed, by prescription or otherwise, over lands located upstream or downstream that, historically or currently, have been flowed or flooded by the Ripogenus Dam.

e. A flowage easement for flowage of any lands conveyed herein, upstream or downstream of the dam, that may from time to time be flowed or flooded in the future by this dam, but only to the extent that such lands historically or currently have been flowed or flooded by the dam, and provided that such flowage easement for land upstream of the dam will not extend further than 943.6 feet MSL U.S.G.S. datum.

The interests described in paragraphs (a), (b), (d) and (e) affect property situated in T4 R13 WELS, T5 R13 WELS, and T5 R14 WELS.

## 3. PENOBSCOT AND PISCATAQUIS COUNTIES

### 3.1 T1-R9 Pemadumcook and Ambajejus Lakes

Certain parcels of land on the shore of Pemadumcook and Ambajejus Lakes in the Township of T1-R9 WELS being a strip of land

200.00 feet wide extending from the High Water Line of said Lake landward and to a line at all times 200.00 feet from said high water line of said Lakes.

Excepting from the Ambajejus Lake area that portion of the premises conveyed by deed from Great Lakes Hydro America, LLC to West Branch Historical Preservation Committee dated April 4, 2017 and recorded in the Piscataquis Registry of Deeds in Book 2488, Page 218, but reserving to Great Lakes Hydro America, LLC all appurtenant rights, flowage rights, and flowage easements as set forth therein.

#### 3.1.1 Town Line to Peninsula (ST-55)

Beginning at the Town Line Post on the northerly shore of Pemadumcook Lake on the line between T1 R9 WELS and T1 R10 WELS at UTM coordinates N 16612013.85, E 1653166.24 feet;

Thence, northerly along said Town Line to a point 200.00 feet from the high water line of Pemadumcook Lake;

Thence, southeasterly, along a line always 200.00 feet from the high water line of said Lake to a line between two rebar set; Thence, along said line, South 87°34'40" West, to a rebar set, said rebar being, South 60°27'30" East, a distance of 12667.35 feet from the point of beginning described immediately above and also being the point of commencement for the parcel described immediately below;

Thence, northwesterly along said high water line to the POINT OF BEGINNING.

#### 3.1.2 Peninsula to Ambajejus Point (ST-54)

Beginning at a rebar set on the shore of said Lake at UTM coordinates N 16605782.33, E 1664524.76 feet also being, North 87°34'40 East, a distance of 338.32 feet from the point of commencement described immediately above;

Thence, along a line toward another rebar set, South 87°34'40" West, to point that is 200.00 feet from the high water line of said Lake;

Thence, continuing easterly on a line that is always 200.00 feet from the high water line of Pemadumcook Lake and continuing along Ambajejus Lake;

Thence, South 61°11'40" East, to an iron pipe found;

Thence, continuing on the same course, a distance of 104.36 feet to a rebar set on the shore of Ambajejus Lake, said point being, South 88°20'20" East, a distance of 6355.87 feet from the point of beginning described immediately above and also being the point of commencement for the parcel described immediately below;

Thence, westerly along the high water line of Ambajejus Lake and continuing onto Pemadumcook Lake to the POINT OF BEGINNING.

3.1.3 Ambajejus Point to the Ambajejus Lake Sporting Camp (ST-54)

Beginning at a rebar set on the shore of Ambajejus Lake having UTM coordinates of N 16606192.86, E 1671269.39 feet and also being, North 33°21'00" East, a distance of 712.08 feet from the point of commencement described immediately above;

Thence, North 69°33'40" West, a distance of 123.45 feet to a rebar set;

Thence, continuing on the same course to a point that is 200.00 feet from the high water line of Ambajejus Lake; Thence, Northwesterly, along a line always 200.00 feet from the high water line of said Lake;

Thence, South 76°37'50" East, to a rebar set;

Thence, on the same course, a distance of 122.06 feet to a rebar set on the shore of said Lake, said point being, North 30°49"30" West, a distance of 10107.29 feet from the point of beginning described immediately above, and also being the point of commencement for the parcel described immediately below;

Thence, southeasterly along said high water line to the POINT OF BEGINNING.

3.1.4 Ambajejus Lake Sporting Camps to end of the Future Developed Area (ST-69)

Beginning at a rebar set at UTM coordinates of N 16615503.74, E 1666118.37 feet and also being, North 02°33'30" East, a distance of 632.07 feet from the point of commencement described immediately above;

Thence, South 50°47'20" West, distance of 61.21 feet to a rebar set;

Thence, continuing on the same course to a point that is 200.00 feet from the high water line of said Lake;

Thence, easterly across the West Branch of the Penobscot River and along a line always 200.00 feet from the high water line of said Ambajejus Lake to the westerly edge of the Future Development Area as shown on ST-61;

Thence, South 55°58'10" West, to a rebar set;

Thence, continuing on the same course, a distance of 81.76 feet to a rebar set, said point being, North 60°43'00" East, a distance of 3306.98 feet from the point of beginning described immediately above, and said point also being the point of commencement for Parcel ST-11;

Thence, continuing on the same course to the high water line of said Lake;

Thence, westerly along the high water line of said Lake to the point of beginning described immediately above.

3.1.5 Parcel ST-11

Beginning at a rebar set on the shore of said Lake at UTM coordinates of N 16616787.89, E 1671146.49 feet, and said point being, South 81°09'30" East, a distance of 2169.54 feet from the point of commencement described immediately above;

Thence, North 53°34'40 West, to a point that is 200.00 feet from the high water line of said Lake; Thence, easterly and southerly along a line always 200.00 feet from the high water line of said Lake;

Thence, North 33°29'40" West, to an iron pipe found which is, South 18°52'10 East, a distance of 932.68 feet from the point of beginning described immediately above and also being the point of commencement for Parcel ST-12 described immediately below; Thence, continuing on the same course, a distance of 44.72 feet to the high water line of said Lake;

Thence, northerly and westerly along said high water mark to the POINT OF BEGINNING.

3.1.6 Parcel ST-12

Beginning at a rebar set on the shore of said Lake being at UTM coordinates N 16613952.71, E 1679256.94 feet, and being, South 75°57'40 East, a distance of 8049.24 feet from the point of commencement described immediately above;

Thence, N 74°20'40" West, to a point 200.00 feet from the high water line of said Lake; Thence, northerly and easterly along a line always 200.00 feet from said high water line; Thence, South 43°27'30" West, to a rebar set;

Thence, continuing on the same course, a distance of 148.10 feet to a rebar set between the access road and the shore of the Lake, said point being, North 73°45'20" East, a distance of 957.87 feet from the point of beginning, also being the point of commencement for Parcel ST-10 described immediately below;

Thence, westerly and southerly along the high water line of said Lake to the POINT OF BEGINNING.

3.1.7 Parcel ST-10

Beginning at a rebar set on the shore of said Lake being at UTM coordinates of N 16611645.10, E 1681713.47 and being, South 30°49'30" East, a distance of 2999.29 feet from the point of commencement described immediately above;

Thence, North 41°08'00" East, a distance of 55.25 feet to an iron pipe found on the side of the Golden Road;

Thence, continuing on the same course across the Golden Road and onto the State Park Road to a point 200.00 feet from the high water line of said Lake;

Thence, southeasterly along a line always 200.00 feet from the high water line of said Lake; Thence, South 68°11'30" West, to a rebar set on the side of the Golden Road;

Thence, continuing on the same course, a distance of 36.21 feet to an iron pipe found, being, South 36°29'30" East, a distance of

157.18 feet from the point of beginning described immediately above, also being the point of commencement for Parcel ST-09 described immediately below;

Thence, northwesterly along the high water line of said Lake to the POINT OF BEGINNING.

3.1.7a. Parcel ST-09

Beginning at a rebar found capped #1027, 10 feet from the shore of Ambajejus Lake, at UTM

coordinates N 16,609,613.22 feet, E 1,679,354.67 feet; also being South 52°09'00" West, a distance of 3105.59 feet from the point of commencement listed immediately above;

Thence, North 35°31'20" West, a distance of 97.83 feet to a rebar found capped #1027;

Thence, continuing along the same course, North 35°31'20" West, to a point which is 15 feet from the centerline of Fire Road 17A, so called;

Thence, generally northeasterly and easterly along a line which is parallel to and 15 feet from the centerline of said road, to a point which is 200 feet from the high water line of said Ambajejus Lake;

Thence, generally southeasterly and southerly along a line always 200 feet from the high water line of said Lake to the edge of a developed zone;

Thence, North 71°33'30" West, to a rebar set near the shore of said Ambajejus Lake, said rebar having UTM coordinates of N 16,609,386.91', E 1,679,518.35', and being the point of commencement for parcel ST-07-01 described immediately below; Thence, continuing on the same course, North 71°33'30" West, to the high water line of said Lake; Thence, generally northerly and northwesterly along the high water line of said Lake;

Thence, North 35°31'20" West, a distance of 10 feet, more or less to the POINT OF BEGINNING.

3.1.8 Parcel ST-07-01

Beginning at a rebar set 57 feet from the shore of the Lake beside an access driveway at UTM coordinates of N 16609085.87, E 1679568.00 feet, also being South 09°22'00" East, a distance of 305.11 feet from the point of commencement listed immediately above;

Thence, along the side of said driveway, North 56°09'00" East, a distance of 69.36 feet to an iron pipe found; Thence, continuing on the same course to a point being 200.00 feet from the high water line of said Lake;

Thence, southerly along a line always 200.00 feet from the high water line of said Lake; Thence, North 89°06'00" West, to an iron pipe found;

Thence, continuing on the same course, a distance of 102.54 feet to an iron pipe found on the shore of said Lake, said iron being, South 28°13'00" East, a distance of 248.24 feet from the point of beginning described immediately above and also being the point of commencement for Parcel ST-07-02 described immediately below;

Thence, northerly and westerly along said high water line;

Thence, North 04°16'00" West, a distance of 57.39 feet to the POINT OF BEGINNING.

3.1.9 Parcel ST-07-02

Beginning at a rebar set 30 feet from the shore of the Lake and beside a driveway, said rebar at UTM coordinates of N 16608562.62, E 1679788.36 feet and also being, South 18°41'10" East, a distance of 321.45 feet from the point of commencement described immediately above;

Thence, along the side of said driveway, South 00°15'20" West, a distance of 167.32 feet; Thence, South 35°12'40" East, to a point 200.00 feet from the high water line of said Lake; Thence, southwesterly along a line always 200.00 feet from the high water line of said Lake; Thence, North 47°23'10" West, to an iron pipe found;

Thence, continuing on the same course, a distance of 105.90 feet to an iron pipe found on the shore of said Lake, being South 36°12'50" West, a distance of 472.58 feet from the point of beginning described immediately above and also being the point of commencement for Parcel ST-08 described immediately below;

Thence, northeasterly along said high water line;

Thence, East, a distance of 27.01 feet to the POINT OF BEGINNING.

3.1.10 Parcel ST-08

Beginning at a an iron pipe found at UTM coordinates N 16601449.21, E 1678657.33 feet and being, South 07°12'40" West, a distance of 6785.81 feet from the point of commencement described immediately above;

Thence, North 18°27'20" West, to a point being 200.00 feet from the high water line of said Lake; Thence, easterly and southerly along a line always 200.00 feet from the high water line of said Lake;

Thence, North 86°27'10" West, to a rebar set being, South 70°10'20" East, a distance of 1302.54 feet from the point of beginning and also being the point of commencement of parcel ST-06 described immediately below;

Thence, northerly and westerly along the high water line of said Lake to the POINT OF BEGINNING.

3.1.11 Parcel ST-06

Beginning at a rebar set between a driveway and the shore of the Lake at UTM coordinates N 16600466.42, E 1679998.58 feet and being, South 12°05'50 East, a distance of 553.25 feet from the point of commencement described immediately above; Thence, North 68°38'20" East, to a point being 200.00 feet from the high water line of said Lake;

Thence, southerly along a line always being 200.00 feet from the high water line of said Lake;

Thence, North 78°53'50" West, to a rebar set on the shore of said Lake which is South 17°53'00" East, a distance of 345.52 feet from the point of beginning described immediately above and also being the point of commencement for Parcel ST-05 described immediately below;

Thence, northerly, along the high water line of said Lake to the POINT OF BEGINNING.

3.1.12 Parcel ST-05

Beginning at an iron pipe found on the shore of the lake at UTM coordinates N 16597834.51, E 1679250.76 feet and being, South 20°20'40" West, a distance of 2456.29 feet from the last point of commencement described immediately above;

Thence, South 62°14'00" East, a distance of 141.65 feet to an iron pipe found;

Thence, South 65°53'50" East, to a point being 200.00 feet from the high water line of said Lake;

Thence, southerly, westerly, and northerly along a line always 200.00 feet from the high water line of said Lake; Thence, along the side of a gravel pit to a rebar set;

Thence, North 67°30'00' East, a distance of 361.90 to a rebar set on the southerly side of the access road, being, South 62°15'40" West, a distance of 729.27 feet from the point of beginning described immediately above and also being the point of commencement for Parcel ST-04 described immediately below;

Thence, to the shore of the Lake;

Thence, following the high water line southerly, easterly, and northerly to the POINT OF BEGINNING.

3.1.13 Parcel ST-04

Beginning at a rebar set between the shore and a driveway at UTM coordinates N 16598310.00, E

1,676,805.36 feet, also being, North 65°38'30" West, a distance of 1975.83 feet from the point of commencement described immediately above;

Thence, along the side of said driveway, South 11°19'20" West, a distance of 96.13 feet to a rebar set; Thence, continuing on the same course, to a point that is 200.00 feet from the high water line of said Lake; Thence, westerly along a line always 200.00 feet from the high water line of said Lake;

Thence, North 56°22'20" East, to a rebar set on the shore of said Lake, being, South 89°40'20" West, a distance of 660.55 feet from the point of beginning described immediately above and also being the point of commencement for Parcel ST-03 described immediately below;

Thence, easterly, along the high water line of said Lake to the POINT OF BEGINNING.

3.1.14 Parcel ST-03

Beginning at an iron pipe found on the shore of said Lake at a UTM coordinate of N 16597570.40, E 1674957.12 feet and being, South 58°1220" West, a distance of 1397.38 feet from the last described point of commencement described immediately above; Thence, South 87°42'30" East, to a point being 200.00 feet from the high water line of said Lake;

Thence, southerly, westerly, and northerly along a line always 200.00 feet from the high water line of said Lake; Thence, South 70°27'00" West, to a rebar set on the northerly side of the access road;

Thence, continuing on the same course, a distance of 84.33 feet to a rebar set, said rebar being, North 47°20'40" East, a distance of 449.46 feet from the point of beginning and also being the point of commencement for Parcel ST-02-01 described immediately below;

Thence continuing on the same course to the high water line of said Lake;

Thence, continuing southerly, easterly, and northerly along the high water line of said Lake to the POINT OF BEGINNING.

3.1.15 Parcel ST-02-01

Beginning at a rebar set on the shore of the Lake being at UTM coordinates N 16597186.19, E 1672959.90 feet, and being, South 87°15'50" West, a distance of 1668.58 feet from the point of commencement described immediately above;

Thence, South 08°25'50" East, to a point that is 200.00 feet from the high water line of said Lake; Thence westerly along a line that is always 200.00 feet from the high water line of said Lake; Thence, North 26°44'50" East, to a rebar set on the northerly side of the access road.

Thence, continuing on the same course, a distance of 151.71 feet to a rebar set on the shore of said Lake, being, South 80°41'30" West, a distance of 1460.96 feet from the point of beginning described immediately above and also being the point of commencement for Parcel ST-02-02 described immediately below;

Thence, easterly along said high water line to the POINT OF BEGINNING

3.1.16 Parcel ST-02-02

Beginning at a rebar set on the shore of said Lake at UTM coordinates N 16597021.56, E 1671254.27 feet, and being, North 74°48'20" West, a distance of 273.47 feet from the point of commencement described immediately above;

Thence, South 38°07'20" East, in the direction of a rebar set to a point being 200.00 feet from the high water line of said Lake; Thence, westerly, along a line always 200.00 feet from the high water line of said Lake;

Thence, North 31°41'10" East, along a line between two rebar set to a rebar set on the shore of said Lake, said rebar being, North 79°20'20" West, distance of 368.65 feet from the point of beginning and also being the point of commencement for Parcel ST-02- 03 described immediately below;

Thence, easterly along the high water line of said Lake to the POINT OF BEGINNING.

3.1.17 Parcel ST-02-03

Beginning at a rebar set on the shore of said Lake at UTM coordinates N 16,597,022.83, E 1670225.05 feet and being, South 84°16'10" West, a distance of 670.28 feet from the point of commencement described immediately above;

Thence, South 08°35'40" West, a distance of 99.80 feet to an iron pipe found;

Thence, South 25°06'40" East, toward or through a rebar set at a point that is 200.00 feet from the high water line of said Lake; Thence, northwesterly along a line that is always 200.00 feet from the high water line of said Lake; Thence, North 12°59'00" East, to a rebar set;

Thence, continuing on the same course, a distance of 96.07 feet to a rebar set between the Lake and the Road, said point being, North 56°51'50" West, a distance of 432.86 feet from the point of beginning and also being the point of commencement for Parcel ST-01 described immediately below;

Thence, to the shore of the Lake;

Thence, southeasterly along the high water line to the POINT OF BEGINNING.

3.1.18 Parcel ST-01

Beginning at a rebar set on the northerly side of the access road at UTM coordinates N16597416.57, E 1668965.24 feet and being, North 80°04'10" West, a distance of 911.00 feet from the point of commencement described immediately above;

Thence, South 11°37'30" East, to a point that is 200.00 feet from the high water line of said Lake; Thence, westerly along a line that is always 200.00 feet from the high water line of said Lake;

Thence, North 10°47'10" East, to a rebar set;

Thence, continuing on the same course, a distance of 156.93 feet to a rebar set on the shore of said Lake, said rebar being, North 67°27'40" West, a distance of 162.68 feet from the point of beginning and also being the point of commencement for the call to the Town Line;

Thence, easterly along the high water line;

Thence, South 11°37'30" East, a distance of 69.47 feet to the POINT OF BEGINNING.

3.1.19 Township 1, Range 9 and Indian Purchase 4 Town Line

Being at UTM coordinates of N 16594,014.45, E 1671778.00 feet and being, South 40°32'20" East, a distance 4558.73 feet from the point of commencement described immediately above.

3.1.20 Southeast Corner of the Township - intentionally omitted

3.1.21 Islands

Together with all islands except Islands listed in Schedule 3 attached hereto and in Section 14.3 herein, and including in this grant without limitation 20 islands identified by the following UTM coordinates in feet:

Northings Eastings

#1 16614220 1680180

#2 16613450 1679820

#3 omitted

#4 omitted

#5 omitted

#6 omitted

#7 omitted

#8 16609510 1677100

#9 16607220 1675690

#10 16615790 1667320

#11 omitted

#12 16603650 1673780

#13 16602310 1672270

#14 16601660 1671940

#15 16598010 1673760

#16 16598240 1673040

#17 omitted

#18 16599710 1671730

#19 16599060 1668520

#20 16604000 1665580

#21 16603760 1665210

#22 16604010 1664560

#23 16603330 1663400

#24 16609140 1657310

#25 16600410 1653730

#26 16599630 1654860

#27 16596990 1661990

3.1.22 Recreation Area No. 3 on North Twin Lake - T1 R9 Piscataquis County - intentionally omitted

3.2 North Twin Development

3.2.1 North Twin Dam Parcel Township 3 Indian Purchase

A certain lot or parcel of land with buildings and improvements thereon, including, without limitation,

the dam and dam structures, situated in the Township 3 Indian Purchase, County of Penobscot, State of Maine and being more particularly described as follows: Beginning at a point northwesterly of the North Twin Dam, which point is on or near the shore of North Twin Lake, also known as Elbow Lake, said point is further described as being located at coordinates of N: 717,622.52 feet, E: 911,941.02 feet of the Maine State Plane Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83); Thence S 28° 03' 54" E, a distance of 597.45 feet to an angle point at or near the southeasterly shoreline of said Elbow Lake; Thence S 45° 38' 29" E, a distance of 202 feet, more or less, to a point defined by the intersection of the line herein described with the northwesterly sideline of the Bangor & Aroostook Railroad right of way;

Thence N 71° 43' E, more or less, by and along the northwesterly sideline of the said Bangor & Aroostook Railroad right of way, a distance of 327 feet, more or less, to a point of curvature in said right of way line;

Thence running in a northeasterly direction by and along the northwesterly sideline of said Bangor & Aroostook Railroad right of way following an 1860.14 foot radius curve to the left, an arc distance of 1574.04 feet to a point of tangency of said curve; Thence N 23° 14' E, more or less, by and along the northwesterly sideline of the said Bangor & Aroostook Railroad right of way along a line that crosses over the West Branch of the Penobscot River, a distance of 736 feet, more or less, to a point on said sideline;

Thence N 89° 38' 32" W, a distance of 180 feet, more or less, to an angle point; Thence N 80° 18' 03" W, a distance of 181.39 feet to an angle point;

Thence S 87° 59' 23" W, a distance of 193.08 feet to an angle point; Thence S 71° 31' 50" W, a distance of 189.79 feet to an angle point; Thence S 26° 25' 21" W, a distance of 194.49 feet to an angle point; Thence S 63° 04' 13" W, a distance of 324.58 feet to an angle point; Thence S 53° 09' 24" W, a distance of 423.79 feet to an angle point;

Thence N 08° 00' 02" W, a distance of 206.96 feet to a point on the southeasterly sideline of a 200 foot wide transmission line right of way that runs from power station at North Twin Dam to the mill in Millinocket, said point is further described as being at coordinates N: 718,360.07 feet, E: 912,616.76 feet, as referenced to the aforementioned coordinate system;

Thence N 64° 40' 51" W along a line that passes through the center power pole at an angle point in the above referenced transmission line, a distance of 239.34 feet to a point on the northwesterly right of way line of said transmission line; Thence N 18° 09' 57" E, a distance of 821.11 feet to an angle point;

Thence N 13° 33' 35" W, a distance of 94.87 feet to an angle point, said point is further described as being located at coordinates N: 719,334.83 feet and E: 912,634.15 feet, as referenced to the aforementioned coordinate system;

Thence running in an easterly direction, northeasterly direction, northerly direction and northwesterly direction a distance of 2650 feet more or less, and at all times staying 200 feet southerly, easterly and northerly of a flowage area on the easterly side of said Elbow Lake, said line terminates at coordinate values of N: 720,874.36 feet, E: 913,173.78 feet, as referenced to the aforementioned coordinate system;

Thence N 7°05'15" E a distance of 1551.94 feet to an angle point, said point is further described as being located at coordinates N: 722,414.44 feet, E: 913,365.27 feet, as referenced to the aforementioned coordinate system;

Thence N 73° 45' 21" W, a distance of 425 feet, more or less, to a point on the shoreline of the normal impoundment level of said Elbow Lake;

Thence running in a general southerly direction following the shoreline as defined by a normal impoundment level of said Elbow Lake, a distance of 11,420 feet, more or less, to the point of beginning.

The above description parcel encompasses 121 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet, E: 977,164.59 feet which are based on the 1992 readjustment.

Including all rights of access, ingress and egress, and the nonexclusive use and control of a gate for security purposes, across property of now or formerly of KT adjacent to said parcel, said gate to be maintained by GLHA and not to be removed without GLHA's prior written consent.

3.2.2 10 Foot Hydroelectric Easement Strip South of Route 11

North of Ferguson Pond

A 10 foot wide Hydroelectric Easement, over, under or through a parcel situated southerly of Route 11 at the northerly end of Ferguson Pond, so called, and 700 feet, more or less, westerly of the north entrance to the Great Northern Paper Company mill in the Town of Millinocket, County of Penobscot, State of Maine and being more particularly described as follows:

A 10 foot wide strip of land bounded northerly by said Route 11 right of way, easterly by the easterly limits of the FERC Project Boundary at the northerly end of said Ferguson Pond and westerly by the westerly limits of said FERC Project Boundary.

The easement described herein is intended to be a strip of land 10 feet wide adjacent to and southerly of said Route 11 right of way, and contained within the limits of said FERC Project Boundary. To the extent that any parcel otherwise conveyed in fee in this deed includes the foregoing easement, the conveyance otherwise set forth in this deed is hereby modified to be an easement, rather than in fee.

3.2.3 10 Foot Hydroelectric Easement Strip East of Route 11

North Twin Area

A 10 foot wide Hydroelectric Easement, over, under or through a parcel situated easterly of Route 11 at its intersection with the West Branch of the Penobscot River near North Twin Dam, so called, in T3, Indian Purchase, County of Penobscot, State of Maine and being more particularly described as follows: Beginning at a point defined by the intersection of the easterly right of way line of said Route 11 with the Expanded FERC Project Boundary located northerly of the West Branch of the Penobscot River;

Thence in a general southerly direction, by and along said right of way, a distance of 200 feet, more or less, to the normal water line of said river;

Thence easterly, by and along said normal water line, a distance of 10 feet, more or less, to a point;

Thence in a general northerly direction, parallel to, concentric with and at all times 10 feet easterly of said Route 11 right of way, a distance of 200 feet, more or less, to a point on said FERC boundary;

Thence in a general westerly direction, by and along said FERC boundary, a distance of 10 feet, more or less, to the point of beginning.

Also a 10 foot wide Hydroelectric Easement, over, under or through a parcel situated easterly of Route 11 in T3, Indian Purchase, County of Penobscot, State of Maine and being more particularly described as follows:

Beginning at a point defined by the intersection of the easterly right of way line of said Route 11 with the Expanded FERC Project Boundary located southerly of the West Branch of the Penobscot River;

Thence in a general northerly direction, by and along said right of way, a distance of 200 feet, more or less, to the normal water line of said river;

Thence easterly, by and along said normal water line, a distance of 10 feet, more or less, to a point;

Thence in a general southerly direction, parallel to, concentric with and at all times 10 feet easterly of said Route 11 right of way, a distance of 200 feet, more or less, to a point on said FERC boundary;

Thence in a general westerly direction, by and along said FERC boundary, a distance of 10 feet, more or less, to the point of beginning.

The easements described herein are intended to be a strip of land 10 feet wide adjacent to and easterly of said Route 11 right of way, running between said Expanded FERC Project Boundary, and the normal water line of said river. To the extent that any parcel otherwise conveyed in fee in this deed includes the foregoing easement, the conveyance otherwise set forth in this deed is hereby modified to be an easement, rather than in fee.

3.3 Stone Dam (Quakish Lake Dam) Quakish and Ferguson Lake Dikes

Millinocket & Township 3, Indian Purchase, Maine

A certain lot or parcel of land with the buildings and improvements thereon, including, without limitation, the dam and dam structures, situated on the shore of Ferguson Lake and Quakish Lake in the Town of Millinocket and Township 3, Indian Purchase, County of Penobscot, State of Maine and being more particularly described as follows:

Beginning at a point on the shore of Ferguson Lake at coordinates N: 718,768.92 feet, E: 928,553.00 feet, said coordinates referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83); said coordinates are intended to identify the location of the boundary line and may not be at the physical location as defined;

Thence S 2° 08' 12" E, a distance of 150.00 feet to a point;

Thence S 61° 53' 43" W, a distance of 145.68 feet to a point; Thence S 76° 10' 55" W, a distance of 118.06 feet to a point; Thence N 82° 02' 56" W, a distance of 165.62 feet to a point; Thence N 67° 28' 26" W, a distance of 101.20 feet to a point; Thence N 42° 32' 55" W, a distance of 115.26 feet to a point; Thence N 66° 25' 01" W, a distance of 655.40 feet to a point; Thence S 75° 45' 01" W, a distance of 1067.72 feet to a point; Thence N 82° 35' 20" W, a distance of 178.53 feet to a point; Thence S 61° 37' 39" W, a distance of 55.07 feet to a point;

Thence N 65° 12' 23" W, crossing into Township 3, Indian Purchase, a distance of 303.54 feet to a point;

Thence S 41° 54' 50" W along a line southeasterly of and parallel to the northwesterly face of Stone Dam, so called, a distance of 1145.45 feet to a point;

Thence N 48° 05' 10" W, a distance of 100.00 feet to a point;

Thence N 2° 44' 12" W, a distance of 215.69 feet to a point on or near the shore of Quakish Lake having coordinates N: 718,222.20 feet, E: 924,993.50 feet; said coordinates are intended to identify the location and direction of the boundary line and may not be at the physical location as defined;

Thence N 41° 54' 50" E, crossing into the Town of Millinocket, a distance of 1291.00 feet to a point on or near the shore of Quakish Lake having coordinates N:719,182.90 feet, E: 925,855.91 feet; said coordinates are intended to identify the location and direction of the boundary line and may not be at the physical location as defined;

Thence by varying courses in a general northerly direction, by and along the easterly shore of Quakish Lake, a distance of 2412 feet, more or less, to a point on said shore line having coordinates N:

719,814.22 feet, E: 925,498.86 feet; said coordinates are intended to identify the location and direction of the boundary line and may not be at the physical location as defined;

Thence N 59° 10' 17" E, a distance of 799.52 feet to a point on or near the westerly shore of Ferguson Lake having coordinates N: 720,223.95 feet, E: 926,185.41 feet; said coordinates are intended to identify the location and direction of the boundary line and may not be at the physical location as defined;

Thence in a general southerly direction, by and along the westerly shore of Ferguson Lake, a distance of 1637 feet, more or less, to a point on or near said shore line having coordinates N: 719,251.20 feet, E: 926,909.13; said coordinates are intended to identify the location and direction of the boundary line and may not be at the physical location as defined;

Thence S 13° 30' 51" E, a distance of 277.72 feet to a point on or near the southerly shore of Ferguson Lake having coordinates N: 718,981.17 feet, E: 926,974.03 feet; said coordinates are intended to identify the location and direction of the boundary line and may not be at the physical location as defined; Thence in a general easterly direction, by and along said shore line, a distance of 2570 feet, more or less, to the point of beginning.

ALSO a certain parcel situated on the northerly shore of Quakish Lake described as follows:

Beginning at a point on or near said shore line having coordinates N: 720,875.55 feet, E: 924,934.64 feet; said coordinates are intended to identify the location and direction of the boundary line and may not be at the physical location as defined;

Thence N 16° 32' 31" E, a distance of 296.47 feet to a point; Thence N 71° 32' 38" W, a distance of 449.94 feet to a point; Thence S 87° 52' 50" W, a distance of 170.24 feet to a point; Thence S 52° 32' 48" W, a distance of 79.37 feet to a point; Thence S 88° 31' 57" W, a distance of 81.94 feet to a point; Thence N 47° 17' 03" W, a distance of 236.83 feet to a point;

Thence S 42° 33' 01" W, a distance of 901.27 feet to a point on or near the shore line of Quakish Lake having coordinates N: 720,742.23 feet, E: 923,493.73 feet, said coordinates are intended to identify the location and direction of the boundary line and may not be at the physical location as defined;

Thence in a general easterly direction, by and along said shore line, a distance of 1851 feet, more or less to the point of beginning.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet, E: 977,164.59 feet which are based on the 1992 readjustment.

ALSO another parcel of land situated in the Town of Millinocket and Township 3, Indian Purchase, being described as a strip of land 200 feet wide offset from both the shoreline of Quakish Lake for its entire perimeter and the West Branch of the Penobscot River upstream from Quakish Lake to the easterly sideline of the Bangor & Aroostook Railroad right-of-way, excepting the rights of the State of Maine and public to use Route #11 and the utilities associated therewith, the right-of-way of Route #11 being 66.00 feet wide, excepting the area over which the Hydroelectric Easement is conveyed in Section 3.2.3 hereinabove, and also excepting the following described parcels:

Exception 1:

Beginning at a point on the northerly shore of Quakish Lake;

Thence N 5° 23' 40" E to an iron rod having coordinates N: 721,044.84 feet, E: 919,722.83 feet;

Thence continuing N 5° 23' 40" E, a distance of 180.90 feet to an iron rod on or near a line offset 200 feet from said shore line; Thence in a general northeasterly direction, by and along said offset line, a distance of 940 feet, more or less to an iron rod on or near said offset line;

Thence S 20° 08' 27" E, a distance of 102.06 feet to an iron rod having coordinates N: 721,603.50 feet, E: 920,421.06 feet; Thence continuing S 20° 08' 27" E to the shore of said Quakish Lake;

Thence in a general southwesterly direction, by and along said shore line, a distance of 1070 feet, more or less, to the point of beginning.

Exception 2:

Beginning at a point on the northerly shore of Quakish Lake;

Thence N 57° 45' 10" E to an iron rod having coordinates N: 718,900.50 feet, E: 918,528.68 feet;

Thence continuing N 57° 45' 10" E, a distance of 135.02 feet to an iron rod on or near a line offset 200 feet from said shore line; Thence in a general northwesterly, easterly and northwesterly direction, by and along said offset line, a distance of 2870 feet, more or less to an iron rod on or near said offset line;

Thence N 74° 29' 52" E, a distance of 221.39 feet to an iron rod having coordinates N: 720,070.80 feet, E: 918,520.82 feet; Thence continuing N 74° 29' 52" E to the shore of said Quakish Lake;

Thence in a general southeasterly, southwesterly, southeasterly, southwesterly, southeasterly, westerly and northwesterly direction, by and along said shoreline, a distance of 3250 feet, more or less, to the point of beginning.

The coordinates listed in exceptions 1 and 2 above are intended for an approximate location of the parcel described and not for boundary definition.

TOGETHER WITH all islands within Quakish Lake.

ALSO another parcel of land situated on Ferguson Lake in the Town of Millinocket being a strip of land 200 feet wide offset from a portion of the westerly shoreline, being further described as follows: Beginning at a point on or near the westerly shore of said Ferguson Lake said point having coordinates N: 720,223.95 feet, E: 926,185.41 feet, as referenced in the above description; Thence generally northerly along said shore line, a distance of 5700 feet, more or less, to a point;

Thence N 12° 15' 08" E to an iron rod having coordinates N: 722,728.56 feet, E: 926,589.36 feet, these coordinates are intended for approximate parcel location and not boundary definition;

Thence continuing N 12° 15' 08" E, a distance of 59.16 feet to an iron rod on or near a line offset 200 feet from said shore line; Thence in a general southerly direction, by and along said line, a distance of 5900 feet, more or less, to a point on said line; Thence easterly to the point of beginning.

Excepting the following described parcel:

Beginning at a point on the westerly shore of Ferguson Lake;

Thence N 74° 35' 17" W to an iron rod having coordinates N: 721,658.26 feet, E: 926,402.40 feet; Thence continuing N 74° 35' 17" W, a distance of 142.02 feet to an iron rod on or near a line offset 200 feet from said shore line;

Thence in a general northeasterly and northwesterly direction, by and along said offset line, a distance of 740 feet, more or less, to an iron rod on or near said offset line;

Thence N 74° 15' 34" E, a distance of 100.34 feet to an iron rod having coordinates N: 722,172.88 feet, E: 926,253.91 feet; Thence continuing N 74° 15' 34" E to the shore line of said Ferguson Lake;

Thence in a general southeasterly and southwesterly direction, by and along said shoreline, a distance of 810 feet, more or less, to the point of beginning.

The coordinates listed in this exception are intended for an approximate location of the parcel described and not for boundary definition, the iron rod is intended to control and nature of the boundary.

TOGETHER WITH all islands within Ferguson Lake.

To the extent that any portion of the parcels described above in Paragraph 3.3 are located in Township 3, Indian Purchase and are located between State Route 11 and property now or formerly of the Bangor & Aroostook Railroad, such parcels are granted as a Hydroelectric Easement, rather than in fee.

3.4 Ferguson Canal

Millinocket Mill - Millinocket, Maine

A certain lot or parcel of land with buildings and improvements including without limitation dikes thereon situated within the Great Northern Paper Company Mill lot in the Town of Millinocket, County of Penobscot State of Maine and being more particularly described as follows:

Beginning at a point at or near the east shore of Ferguson Lake at the coordinates N: 721,895.5 feet, E: 929,278.1 feet; coordinates are referenced to the Maine State Coordinate System, East Zone, NAD 83, and are intended to establish the location of said beginning point said point is further described as being 1785 feet, more or less, northwesterly of the most northerly corner of the headgate building and 330 feet, more or less southwesterly of the access road leading into the mill site; Thence S 87° 45' 22" E, a distance of 138.71 feet to a point; Thence S 49° 48' 36" E, a distance of 192.05 feet to a point; Thence S 31° 25' 20" E, a distance of 107.53 feet to a point; Thence S 88° 44' 32" E, a distance of 108.57 feet to a point; Thence S 72° 35' 48" E, a distance of 63.75 feet to a point; Thence N 75° 27' 31" E, a distance of 242.20 feet to a point; Thence N 75° 32' 32" E, a distance of 76.37 feet to a point; Thence N 82° 40' 04" E, a distance of 158.74 feet to a point; Thence S 83° 15' 09" E, a distance of 91.28 feet to a point; Thence S 64° 04' 44" E, a distance of 532.53 feet to a point; Thence N 87° 25' 23" E, a distance of 132.53 feet to a point; Thence N 53° 40' 02" E, a distance of 106.60 feet to a point, said point is further described as being 109 feet, more or less, northerly of the most northerly corner of the headgate building; Thence S 40° 27' 15" E, a distance of 401.54 feet to a point; Thence S 38° 54' 35" W, a distance of 142.43 feet to a point; Thence S 58° 01' 04" W, a distance of 157.50 feet to a point; Thence N 73° 37' 40" W, a distance of 913.21 feet to a point, that is northeasterly of a large steel transmission tower; Thence N 89° 03' 42" W, a distance of 72.77 feet to a point; Thence N 32° 23' 58" W, a distance of 152.86 feet to a point at or near the south shoreline of said Ferguson Canal, having coordinates of N:721,466.48 feet, E:930,049.18 feet; Thence continuing on the same course N 32° 23' 58" W, a distance of 118 feet, more or less, to a point on the north shoreline of said Ferguson Canal; Thence westerly by and along the southerly north shoreline of the Ferguson Canal continuing along the shoreline of said Ferguson Lake a distance of 1,375 feet more or less to the point of beginning.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet, E: 977,164.59 feet which are based on the 1992 readjustment.

3.5 North and South Twin Lakes and Elbow Pond In Indian Purchase #3 and #4

Certain parcels of land on North and South Twin Lakes and Elbow Pond being a strip of land 200.00 feet wide extending from the High Water of said Lake landward and to a line at all times 200.00 feet from said high water line of said Lake.

To the extent that any portion of the parcels described below in Paragraphs 3.5.1 to 3.5.19 are located in Township 3, Indian

Purchase or in Township 4, Indian Purchase, and are located between State Route 11 and property now or formerly of the Bangor and Aroostook Railroad, such parcels are granted as a Hydroelectric Easement, rather than in fee.

3.5.1 Parcel ST 57 and ST 67

Said Parcel beginning at an iron pipe found on the North shore of North Twin Lake on the Town Line between T1-R9 WELS and T4 Indian Purchase at UTM coordinates N 16594014.46, E 1671778.00 feet;

Thence, North 75°14'30" East, a distance of 111.43 feet to a rebar set;

Thence, continuing on the same course to a point that is 200.00 feet from the high water line of said Lake, it is noted that the high water line for these lakes is 491.92, MLS U.S.G.S. datum;

Thence, continuing southeasterly and northeasterly and always being 200.00 feet from the high water line of said Lake to the westerly bounds of a developed zone;

Thence, along said zone, South 20°53'20" East, to an iron pipe found;

Thence, continuing on the same course, a distance of 149.60 feet to an iron pipe found, said iron pipe being, South 66°52'50" East, a distance of 1700.05 feet from the point of beginning described immediately above and also being the point of commencement for the next parcel described immediately below;

Thence, continuing on the same course to the high water line of said Lake;

Thence, continuing southwesterly and northwesterly along said Lake high water line to the Town Line between T1-R9 WELS and T4 Indian Purchase;

Thence, along said Town Line North 75°14'30" East to the POINT OF BEGINNING.

3.5.2 Parcel ST 67 and ST 68

Beginning at a rebar set on the North shore of North Twin Lake, said rebar being, North 68°03'20" East, a distance of 201.95 feet from the point of commencement described above and at UTM coordinates of N 16593422.37, E 1673528.82 feet;

Thence, North 20°53'20" West, a distance of 40.00 feet to a rebar set;

Thence, continuing on the same course to a point that is 200.00 feet from the high water line of said Lake;

Thence, continuing southeasterly, southwesterly, easterly, and northerly along said line always being 200.00 from the high water line of said Lake to the westerly bound of a developed zone;

Thence, South 55°29'40" East, to an iron pipe found;

Thence, continuing on the same course, a distance of 159.86 feet to a rebar set, said rebar being, South 65°59'50" East, a distance of 1683.51 feet from the point of beginning described immediately above and also being the point of commencement for the next parcel described immediately below;

Thence, continuing on the same course to the high water line of said Lake;

Thence, continuing southerly, westerly, and northeasterly along the high water line of said Lake to the POINT OF BEGINNING.

3.5.3 Parcel ST 68 and ST 69

Beginning at an iron pipe found on the shore of said Lake being, North 25°06'50" East, a distance of 200.00 feet from the point of commencement described above and at UTM coordinates of N 16592918.66, E 1675151.65 feet;

Thence, North 35°24'00" West, a distance of 149.66 feet to an iron pipe found;

Thence, continuing on the same course to a point 200.00 feet from the high water line of said Lake; Thence, continuing northeasterly, southeasterly, southerly, easterly, northerly, easterly, and southerly along said line always being 200.00 feet from the high water line to the northerly bounds of a developed area;

Thence, North 83°05'00" West, to a rebar set, said rebar being, South 60°38'10" East, a distance of 2263.73 feet from the point of beginning described immediately above and also being the point of commencement for the next parcel described immediately below;

Thence, continuing northerly, westerly, southerly, westerly, northerly, and northwesterly along the high water line of said Lake to the POINT OF BEGINNING.

3.5.4 Parcel ST 70 and Norcross

Beginning at a rebar set on the North shore of Elbow Pond at the high water line, being, North 57°07'50" East, a distance of 1706.34 feet from a rebar set on the shore of North Twin Lake and on the Town Line between T3 and T4 Indian Purchase which is, South 48°20'40" East, a distance of 15293.10 feet from the point of commencement described immediately above and at UTM coordinates of N 16582570.06; E 1689983.96 feet;

Thence, South 80°48'10" West, a distance of 78.48 feet to a rebar set;

Thence, continuing on the same course to a point 200.00 feet from the high water line of said Pond;

Thence, continuing clockwise around Elbow Pond along said line always being 200.00 feet from the high water line to the northeasterly bounds of a developed area known as Norcross at a point, North 13°05'00" West, a distance of 45.30 feet from a cedar stake found at the southeast corner of Norcross;

Thence, continuing northerly along said Line, North 13°05'00" West, a distance of 200.00 feet to a point on the shore of Elbow Pond at the high water line of said Pond being, South 28°29'30" East, a distance of 5987.88 feet from the point of beginning described immediately above and also being the point of commencement for the parcel described immediately below; Thence, along the high water line of said Pond counter clockwise around said Pond to the POINT OF BEGINNING.

This may also include the Dam Site and other developments at the outlet of said Elbow Pond as surveyed by Plisga and Day, Land Surveyors, described at Section 3.2.1.

EXCEPTING the Bangor & Aroostook Railroad properties.

EXCEPTING a certain parcel of land west of North Twin Dam conveyed to Mark D. MacDonald and Lynne C. MacDonald on November 26, 1980 and recorded in the Penobscot County Registry of Deeds at Book 3146, Page 331, described as follows: Commencing at an iron pin on the northerly sideline of Route #11 and 2,750 feet westerly of the northwesterly abutment of the bridge crossing the West Branch of the Penobscot River below North Twin Dam;

Thence, South 79°39'00" West along the northerly line of Route #11 a distance of 201.20 feet to an iron pin;

Thence, North 04°15'00" West a distance of 561.50 feet to an iron pin on the southerly sideline of the Bangor & Aroostook Railroad, said pin being the POINT OF BEGINNING.

Thence, due east along the southerly sideline of the Bangor & Aroostook Railroad to a point 200.00 feet from the high water line of Elbow Pond;

Thence, southwesterly along a line that is always 200.00 feet from said high water line of said Pond to a line South 04°15'00" East from the iron pin marking the beginning point;

Thence, North 04°15'00" East, to the POINT OF BEGINNING. Said parcel containing 0.25 acres, more or less.

3.5.5 Parcel ST 73

Said parcel beginning at a rebar set on the northwesterly shore of an island in North Twin Lake, said rebar having UTM coordinates of N 16,575,648.94 feet, E 1,687,462.77 feet, and being, South 75°21'30" West, a distance of 5615.64 feet from the point of commencement listed immediately above;

Thence, crossing said island, South 00°41'10" West, a distance of 72.75 feet, to a rebar set on the southwesterly shore of said island, having UTM coordinates of N 16,575,576.20', E 1,687,461.90', which rebar will be the point of commencement for the parcel described immediately below;

Thence, continuing on the same course, South 00°41'10" West, to the high water line of North Twin Lake; Thence, generally northerly, westerly, and southwesterly along the high water line of said Lake;

Thence, North 29°22'50" West, to a rebar set on the southeasterly shore of an island;

Thence, North 29°22'50" West, 205.06 feet to a rebar set on the northerly shore of said island; Thence, North 29°22'50" West, to the high water line of North Twin Lake;

Thence, generally northeasterly, southeasterly, and northeasterly along the high water line of said Lake; Thence, South 00°41'00" West, to the POINT OF BEGINNING.

3.5.6 Parcel ST 63-1

Said parcel beginning at a rebar set on or near the westerly right-of-way of the Bangor & Aroostook Railroad and being, South 09°32'30" West, a distance of 6137.09 feet from the point of commencement described immediately above and being at UTM coordinates of N 16569524.03, E 1686444.51 feet; Thence, crossing said Railroad, South 74°16'20" East, a distance of 99.17 feet to a cedar post found and rebar set at the base thereof, on or near the easterly right of way of said railroad, and at the southwest corner of a privately owned parcel;

Thence, along said Private Parcel, South 81°13'10" East, to a point 200.00 feet from the high water line of said Lake;

Thence southwesterly and along a line always being 200.00 feet from the high water line of said Lake; Thence, North 77°36'50" West, to a rebar set on or near the easterly right-of-way of said Railroad;

Thence, on the same course and crossing said Railroad, a distance of 99.39 feet to a rebar set being, South 04°51'20" West, a distance of 233.52 feet from the point of beginning described immediately above and the point of commencement of Parcel ST 63- 2 described immediately below;

Thence, continuing on the same course to the high water line of said Lake; Thence, northeasterly along said high water line;

Thence, South 74°16'20" East, to a rebar set on or near the northerly right-of-way of said Railroad and the POINT OF BEGINNING.

Excepting the Bangor & Aroostook Railroad Properties being a 99.00 foot wide right-of-way described as follows: Beginning at the same point of beginning described immediately above;

Thence, crossing said Railroad, South 74°16'20" East, a distance of 99.17 feet to a cedar post found

and rebar set at the base thereof, on or near the easterly right-of-way of said railroad, and at the southwest corner of a privately owned parcel;

Thence, southerly along said right-of-way on a curve to left, with a tie course of, South 04°34'00" West, a distance of 227.84 feet to a rebar set on or near said easterly right-of-way;

Thence, crossing said right-of-way, North 77°36'50" West a distance of 99.39 feet to a rebar set on or near the westerly right-of- way;

Thence, northerly along said right-of-way and a curve to the right, with a tie course of, North 04°51'20" East, a distance of 233.52 feet to the POINT OF BEGINNING.

3.5.7 Parcel ST 63-2

Said Parcel beginning at a rebar set on or near the westerly right-of-way of said Railroad being, South 03°47'10" West, a distance of 283.49 feet from the point of commencement described immediately above, also being at UTM coordinates N 16569008.47, E 1686406.03 feet;

Thence, crossing said Railroad, South 84°31'00" East, a distance of 98.19 feet to a rebar set on or near the easterly right-of-way of said railroad;

Thence, continuing on the same course to a point 200.00 feet from the high water line of said Lake; Thence southwesterly and along a line always being 200.00 feet from the high water line of said Lake; Thence, North 54°23'30" West, to a rebar set on or near the easterly right-of-way of said Railroad;

Thence, continuing on the same course and crossing said railroad, a distance of 116.03 feet to a rebar set on or near the westerly right-of-way of said railroad and being the point of commencement of Parcel ST 63-3 described immediately below, said rebar being, South 03°52'10" West, a distance of 388.79 feet from the point of beginning immediately above;

Thence, continuing on the same course to the high water line of said Lake; Thence, northerly along said highwater line;

Thence, South 84'31'00" East, to the POINT OF BEGINNING.

Excepting the Bangor & Aroostook Railroad Properties, being a 99.00 foot wide right-of-way described as follows: Beginning at the same point of beginning as described immediately above;

Thence, across said Railroad, South 84°31'00" East, a distance of 98.19 feet to a rebar set on or near the easterly right-of-way of said railroad;

Thence, southerly along said right-of-way, South 03°48'10" West, a distance of 447.07 feet to a rebar set on or near said right-of- way;

Thence, crossing said railroad, North 54°23'30" West, a distance of 116.03 feet to a rebar set on or near the westerly right-of-way of said Railroad;

Thence, northerly along said right-of-way, North 03°52'10" East, a distance of 388.79 feet, to the POINT OF BEGINNING.

3.5.8 Parcel ST 63-3

Said Parcel beginning at a rebar set on or near the westerly right-of-way of said Railroad being, South 03°41'40" West, a distance of 589.50 feet from the point of commencement described immediately above and being at UTM coordinates N 16568032.28, E 1686341.81 feet;

Thence, crossing said Railroad, South 83°09'40" East, a distance of 97.64 feet to a rebar set on or near the easterly right-of-way of said Railroad;



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Thence continuing on the same course to a point being 200.00 feet from the high water line of said Lake;

Thence, southwesterly and along a line always being 200.00 feet from the high water line of said Lake to the northerly bound of a lease formerly to Barton's Marina;

Thence, along said lease, South 76°36'10" West, to an iron rod found, being South 24°39'20" West, a distance of 491.76 feet from the point of beginning described immediately above and also being the point of commencement of ST 63-4 described immediately below;

Thence, North 56°35'50" West, to the high water line of said Lake; Thence, northerly along said high water line;

Thence, South 83°09'40" East, to the POINT OF BEGINNING.

Excepting the Bangor & Aroostook Railroad Properties being a 99.00 foot wide right-of-way described as follows: Beginning at the same point of beginning as described immediately above;

Thence, crossing said Railroad, South 83°09'40" East, a distance of 97.64 feet to a rebar set on or near the easterly right-of-way of said Railroad;

Thence, southerly along said easterly right-of-way to a point being 200.00 feet from the high water line of said Lake;

Thence, southwesterly and along a line always being 200.00 feet from the high water line of said Lake to the westerly right-of-way of said railroad, having a tie course from the last mentioned rebar of, South 15°57'00" West, a distance of 344.64 feet;

Thence, northerly along said right-of-way, along a curve to the right, having a tie course of, North 00°22'20" West, a distance of

343.00 feet, to the POINT OF BEGINNING.

3.5.9 Parcel ST 63-4

Said Parcel beginning at an iron pipe found in the southwest corner of a lease formerly to Barton's Marina and now or formerly owned by Rick Levasseur and being, South 14°04'30" East, a distance of 642.41 feet from the point of commencement described immediately above and also being at UTM coordinates N 16,566,962.24, E 1,686,292.91 feet;

Thence, along said Lease, North 59°55'40" East, to a point 200.00 feet from the high water line of said Lake; Thence, southeasterly and southerly along a line being always 200.00 feet from the high water line of said Lake; Thence, North 75°38'10" West, to a rebar set;

Thence, on the same course a distance, of 81.34 feet to a rebar set, said rebar being, South 06°46'30" West, a distance of 1351.79 feet from the point of beginning and also being the point of commencement for ST 63-5 described immediately below;

Thence, continuing on the same course to the high water line of the Lake; Thence, northerly along the high water line of said Lake;

Thence, North 59°55'40" East, to the POINT OF BEGINNING.

Excepting the rights of the State of Maine and public to use Route #11 and the utilities associated therewith, the right-of-way of Route #11 being 66.00 feet wide and described as follows:

Commencing at the point of beginning listed immediately above;

Thence, South 25°02'10" East, a distance of 562.70 feet to the point of beginning on the westerly right-

of-way of said Route #11; Thence, along a line always 200.00 feet from the high water line, crossing said right-of-way, with a tie line of, South 39°06'00" East, a distance of 68.38 feet to a point on the easterly right-of-way of said Route #11

Thence, generally southerly, along the easterly right-of-way of said Route #11, along a curve to the left, having a tie course of, South 26°10'50" West, a distance of 883.14 feet to a point, said point being located, North 75°38'10" West, a distance of 28.59 feet from a rebar set;

Thence, crossing said right-of-way, North 75°38'10" West, a distance of 66.00 feet to the westerly right-of-way of said Route #11; Thence, generally northerly, along the westerly right-of-way of said Route #11, along a curve to the right, having a tie course of, North 26°20'00" East, a distance of 925.25 feet to the POINT OF BEGINNING.

3.5.10 Parcel ST 63-5

Said parcel beginning at a rebar set on or near the westerly right-of-way of Route #11, being, South 15°20'10" West, a distance of

286.75 feet from the point of commencement described immediately above, also being at UTM coordinates N 16565343.36, E 1686057.60 feet;

Thence, crossing said Route #11, South 73°52'40" East, a distance of 82.46 feet to a rebar set; Thence, continuing on the same course to a point 200.00 feet from the high water line of said Lake; Thence, southerly along a line always being 200.00 feet from the high water line of said Lake; Thence, North 73°55'50" West, to a rebar set;

Thence, continuing on the same course, crossing said Route #11, a distance of 82.00 feet to a rebar set on or near the westerly right-of-way of said Route #11, being South 15°00'40" West, a distance of 160.97 feet from the point of beginning described immediately above and also being the point of commencement for ST-63-6 described immediately below;

Thence, continuing on the same course, to the high water line of said Lake; Thence, northerly along the high water line of said Lake;

Thence, continuing, South 73°52'40" East, to a rebar set, being the POINT OF BEGINNING.

Excepting the rights of the State of Maine and public to use Route #11 and the utilities associated therewith, the right-of-way of Route #11 being 66.00 feet wide and described as follows:

Beginning at the same point of beginning listed immediately above;

Thence, crossing said Route #11, South 73°52'40" East, a distance of 65.47 feet to the easterly right-of-way of said Route #11; Thence, southerly, along said right-of-way to the southerly bound of the parcel described above, having a tie course of, South 15°02'00" West, a distance of 160.91 feet;

Thence, crossing said right-of-way, North 73°55'50" West, a distance of 65.41 feet to a rebar set on or near the westerly right-of- way of said Route #11;

Thence, northerly, along said right-of-way, having a tie course of, North 15°00'40" East, a distance of 160.97 feet, to the POINT OF BEGINNING.

3.5.11 Parcel ST 63-6

Beginning at point on the shore of said Lake, being, South 28°04'40" West, a distance of 478.34 feet from the point of commencement described immediately above and being at UTM coordinates N 16564765.84, E 1685790.77 feet;

Thence, to Route #11, crossing Route #11, and continuing, South 56°00'00" East to a point being 200.00 feet from the high water line of said Lake;

Thence, southerly along a line being always 200.00 feet from the high water line of said Lake to a rebar set;

Thence, to Route #11, and crossing Route #11, North 30°05'30" West, a distance of 91.78 feet to a rebar set on or near the westerly right-of-way of said Route #11, being South 19°34'30" West, a distance of 290.88 feet from the point of beginning of this parcel and also being the point of commencement for the next site described below.

Thence, on the same course to the high water line of said Lake;

Thence, northerly along said high water line to the POINT OF BEGINNING.

Excepting the rights of the State of Maine and public to use Route #11 and the utilities associated therewith, the right-of-way of Route #11 being 66.00 feet wide and described as follows:

Commencing at the point of beginning listed immediately above;

Thence, South 56°00'00" East, a distance of 59.52 feet to a point on the westerly right-of-way of Route #11, being the point of beginning;

Thence, crossing Route #11, South 56°00'00" East, a distance of 66.18 feet to the easterly right-of-way of said Route #11; Thence, southwesterly along said right-of-way, to the southerly bound of the parcel described above, having a tie course of South 31°48'50" West, a distance of 313.61 feet;

Thence, crossing said Route #11, North 30°05'30" West, a distance of 72.48 feet to a rebar set on or near the westerly right-of-way of said Route #11;

Thence, northeasterly along said right-of-way, North 31°22'10" East, a distance of 282.01 feet to the POINT OF BEGINNING.

3.5.12 Parcel ST 64

Beginning at a rebar set and being on the northerly side of the Turkey Tail Road so called and being, North 48°35'10" West, a distance of 8453.47 feet from the point of commencement described immediately above and being at UTM coordinates of N 16570083.62, E 1679353.56 feet;

Thence, South 17°04'30" East, a distance of 36.83 feet to a rebar set;

Thence, continuing on the same course to a point that is 200.00 feet from the high water line of said Lake; Thence, westerly and always being 200.00 feet from the high water line of said Lake;

Thence, North 49°12'10" East, crossing said Turkey Tail Road to a rebar set,

Thence, continuing on the same course, a distance of 40.35 feet to a rebar set, said rebar being the point of commencement for the parcel ST 65-1 as described below and also being, North 71°54'20" West, a distance of 348.54 feet from the point of beginning above;

Thence, continuing on the same course to the high water line of said Lake; Thence, easterly along said high water line;

Thence, South 17°04'30" East, to the POINT OF BEGINNING.

3.5.13 Parcel ST 65-1

Beginning at an iron pipe found on the shore of said Lake being, North 83°25'30" West, a distance of 6459.00 feet from the point of commencement described immediately above and at UTM coordinates of N 16570931.35, E 1672605.73 feet;

Thence, South 12°40'10" East, a distance of 171.00 feet to a rebar set;

Thence, continuing on the same course to a point that is 200.00 feet from the high water line of said Lake;

Thence, continuing westerly and northerly along said line always being 200.00 feet from the high water line to the easterly bound of a cottage lease;

Thence along said lease, North 13°34'00" West, to an iron pipe found;

Thence continuing on the same course, a distance of 149.18 to an iron pipe found being, North 59°52'20" West, a distance of 1575.58 feet from the point of beginning described immediately above and also being the point of commencement for ST 65-2 described immediately below;

Thence, continuing on the same course to the high water line of said Lake;

Thence, continuing generally easterly and northerly along said high water line to the easterly bounds of Lease No. 2233; Thence, continuing northerly along the easterly bounds of said Lease Lot to the high water line of said Lake;

Thence, continuing generally in a northerly direction along the high water line of said Lake to the southerly bound of Lease No. 2910;

Thence, continuing easterly along the southerly bound of said Lease Lot to a rebar set on the high water line of said Lake being, North 17°38'10" West, a distance of 915.71 feet from the iron pipe found described immediately above and at UTM coordinates of N 16572594.84, E 1670965.55 feet;

Thence, continuing generally in a southerly and easterly direction along the high water line of said Lake to the POINT OF BEGINNING.

3.5.14 Parcel ST 65-2

Beginning at an iron pipe found on the West side of said Lease mentioned immediately above being, South 29°35'20" West, a distance of 200.85 feet from the point of commencement described above, said point also being at UTM coordinates N 16571547.51, E 1671143.82 feet;

Thence, South 19°31'10" East, to a point that is 200.00 feet from the high water line of the North side of the causeway; Thence, continuing westerly on said line being always 200.00 feet from said high water line;

Thence, North 47°39'40" East, to a rebar set on the South side of the access road;

Thence, on the same course crossing the road, a distance of 79.59 feet to a rebar set on the edge of the Lake being, North 89°40'50" West, a distance of 324.29 feet from the point of beginning, also being the point of commencement for ST 71 and ST 72 described immediately below;

Thence, going along said high water line on the causeway easterly and northerly to a point on the shore near the point of beginning;

Thence, South 89°40'50" East, to the POINT OF BEGINNING.

3.5.15 Parcel ST 71 and ST 72

Said Parcel beginning at a rebar set on the shore of said Lake being, North 87°20'10" West, a distance of 2775.62 feet from the point of commencement described immediately above, said rebar also being at UTM coordinates N 16571678.35, E 1668046.91 feet;

Thence, South 69°30'00" East, a distance of 64.10 feet to a rebar set;

Thence, continuing on the same course to a point being 200.00 feet from the high water line of said Lake;

Thence, going southerly, westerly, and northerly along said line always being 200.00 feet from the high water line of said Lake to a developed zone;

Thence, continuing along said zone, South 07°51'50" East, to a rebar set;

Thence, continuing on the same course, a distance of 75.00 feet to a rebar set, said rebar being, North 01°57'10 East, a distance of 5204.17 feet from the point of beginning, also being the point of commencement for ST 72 and ST 66 described immediately below;

Thence, continuing on the same course to the high water line of said Lake;

Thence, going westerly, southerly, and easterly along the high water line of said Lake; Thence, South 69°30'00" East, to the POINT OF BEGINNING.

3.5.16 Parcels ST 72 and ST 66

Said Parcel beginning at a rebar set on the shore of said Lake being, North 31°06'00" East, a distance of 278.56 feet from the point of commencement described immediately above, said rebar also being at UTM coordinates N 16577118.02, E 1668368.02 feet; Thence, South 86°00'50" West, a distance of 51.02 feet to a rebar set;

Thence, continuing on the same course to a point being 200.00 feet from the high water line of said Lake;

Thence, going northerly and easterly along said line always being 200.00 feet from the high water line of said Lake to the northwesterly line of a developed area with a rebar set at each end of the line;

Thence, South 31°26'50" West, along said line to a rebar set, said rebar being, South 83'42'10" East, a distance of 11926.09 feet from the point of beginning described immediately above and also being the point of commencement for ST 66 and ST 56 described immediately below;

Thence, going westerly and southerly along the high water line of said Lake; Thence, South 86°00'50" West, to the POINT OF BEGINNING.

3.5.17 Parcels ST 66 and ST 56

Said Parcel beginning at a rebar set on the shore of said Lake being, North 31°26'50" East, a distance of 373.77 feet from the point of commencement described immediately above, said rebar also being at UTM coordinates N 16576128.66, E 1680417.14 feet; Thence, South 31°26'50" West, to a point 200.00 feet from the high water line of said Lake;

Thence, going northwesterly along said line always being 200.00 feet from the high water line of said Lake; Thence, North 00°10'00" West, to an iron pipe found;

Thence, continuing on the same course, a distance of 200.66 feet to a rebar set, said rebar being, North 27°18'20" West, a distance of 15820.14 feet from the point of beginning described immediately above and being the point of commencement for ST 56 described immediately below;

Thence, continuing on the same course to the high water line of said Lake; Thence, going Southeasterly along the high water line of said Lake; Thence, South 31°26'50" West, to the POINT OF BEGINNING.

3.5.18 Parcel ST 56

Said Parcel beginning at a rebar set on the shore of said Lake being, South 87°30'20" West, a distance of 608.96 feet from the point of commencement described immediately above, said rebar also being at UTM coordinates N 16590159.43, E 1672551.38 feet;

Thence, South 39°05'20" West, a distance of 79.88 feet to a rebar set;

Thence, continuing on the same course to a point 200.00 feet from the high water line of said Lake; Thence, going westerly along said line always being 200.00 feet from the high water line of said Lake to the line between T1-R9 WELS and T4 Indian Purchase; Thence, going easterly along said Line to a cedar post found and a rebar set being, North 73°23'50", a distance of 7857.32 feet from the point of beginning described immediately above and being the point of beginning for the closing course described immediately below;

Thence, going southeasterly along the high water line of said Lake to the POINT OF BEGINNING.

3.5.19 Closing Course

Beginning at the point of beginning described immediately above;

Thence, along the Town Line between T1-R9 WELS and T4 Indian Purchase, North 76°35'50" East, a distance of 6945.49 feet to the point of beginning of the first parcel in this series.

3.5.20 Islands

Together with all islands except islands listed in Schedule 3 attached hereto and in Section 14.3 herein and including in this grant without limitation 20 islands identified by the following UTM coordinates in feet:

Northings Eastings

#1 16591380 1677000

#2 16582420 1686500

#3 omitted

#4 16583500 1691230

#5 16584170 1692850

#6 16583370 1692280

#7 16582640 1694580

#8 16582700 1695930

#9 16582090 1695380

#10 16581130 1693950

#11 16580760 1693430

#12 16580790 1695570

#13 16580470 1694580

#14 16579310 1694170

#15 16579350 1693370

#16 16577120 1684380

#17 omitted

#18 16576190 1684420

#19 omitted

#20 16575700 1687130

#21 16576880 1668220

#22 16575730 1668490

#23 16574090 1667300

3.5.21 Recreation Area No. 4

A certain parcel of land situated in the Town of T4 Indian Purchase, County of Penobscot, State of Maine, on the westerly shore of South Twin Lake also known as Recreation Area No. 4 as shown on Exhibit G Sheet 2 of 10 Penobscot Mills Project Boundary Map North Twin Development. Described more particularly as follows:

Beginning at a rebar set marking the northwest corner of said Recreation Area No. 4 at UTM coordinates North 16576457.77, East 1666813.94 feet;

Thence, easterly on a UTM grid bearing of North 52°26'30" East, a distance of 1810.20 feet to a rebar set on the shore of South Twin Lake at North 16577561.23, East 1668248.93 feet to the high water line at MSL elevation of 491.92 feet U.S.G.S. datum; Thence, southerly along said high water line coming to a rebar set being the northeast corner of a developed area (see Parcel ST- 72);

Thence, continuing westerly along said high water line coming to a rebar set being the southwest corner of said developed area; Thence, southerly along said high water line;

Thence, continuing in a westerly direction along said high water line; Thence, in a northerly direction along said high water line;

Thence, westerly along the high water line;

Thence, in a northerly direction along the high water line, to the Point of Beginning. The above-described parcel of land containing 36 acres, more or less.

EXCEPTING said developed area, also being a certain parcel of leased land described as follows:

Said Parcel beginning at a rebar set near the shore of said Lake, being at UTM coordinates N 16577118.02. E 1668368.02 feet; Thence, North 86°00'50" East to the high water line of said Lake at MSL elevation of 491.92 feet U.S.G.S. datum;

Thence, continuing in an easterly, southerly, and westerly direction along said high water line to a point;

Thence, North 07°51'50" West to a rebar set, said rebar being at UTM coordinates North 16576879.50 East 1668224.13 feet; Thence, North 31°06'00" East, a distance of 278.56 feet to the POINT OF BEGINNING. Said parcel of land containing approximately 1 acre.

The above-described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham, PLS #1027, and shown on a Plat dated September 17, 2001. All bearings are UTM Grid. All monuments set were 5/8 inch metal rebar with yellow plastic caps affixed to them, with "D. Bridgham, PLS #1027" imprinted in the caps. September 20, 2001.

3.5.22 Recreation Area No. 5

A certain parcel of land situated in the Township Indian Purchase No. 4, County of Penobscot, State of Maine on the southeasterly shore of South Twin Lake also known as Recreation Area No. 5 as shown on Exhibit G Sheet 2 of 10 Penobscot Mills Project Boundary Map North Twin Development.

Described more particularly as follows:

Beginning on the high water line of South Twin Lake at an MSL elevation of 491.92 U.S.G.S. and the southerly bound of Lease Lot No. 424;

Thence, along the southerly bound of said Lease in an easterly direction, South 83°09'40" East, to a rebar set on the westerly right- of-way of Bangor & Aroostook Railroad being 100 feet wide, said rebar being at UTM coordinates North 16568032.28, East 1686341.81 feet;

Thence, continuing in a southerly direction along said right-of-way to the westerly right-of-way of Route #11 being 66 feet wide and being, North 14°24'30" West, a distance of 1402.05 feet from the above-described rebar set;

Thence, continuing in a southerly direction along said Route #11 right-of-way to a rebar set on the westerly bounds of said right-of- way at the northerly bounds of Lease Lot No. 125A, said rebar being at UTM coordinates North 16565619.89, East 1686133.44 feet, said rebar being, South 06°46'30" West, a distance of 1351.79 feet, then being, South 14°04'30" East, a distance of 642.41 feet, then being South 24°39'20" West, a distance of 491.76 feet from the first rebar set above;

Thence, continuing in a westerly direction along the northerly bounds of said Lease Lot, North 75°38'10" West, to the high water line of said Lake at the MLS elevation of 491.92 U.S.G.S.;

Thence, continuing in a northerly direction along the high water line of said Lake to the Point of Beginning. Said Parcel containing 19 acres, more or less.

The above-described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham, PLS #1027, and shown on a Plat dated September 17, 2001. All bearings are UTM Grid. All monuments set were 5/8 inch metal rebar with yellow plastic caps affixed to them, with "D. Bridgham, PLS #1027" imprinted in the caps. September 19, 2001.

EXCEPTING a certain parcel of land formerly leased to Barton's Marina, more particularly bounded and describe in deed from Maine Timberlands Company to Richard B. Levasseur dated August 2002 and recorded in the Penobscot County Registry of Deeds in Book 8307, Page 22, on August 7, 2002.

TOGETHER WITH rights reserved in said deed to Levasseur recorded in Book 8307, Page 22, in and to the 'Camp Road/Old R/R Spur" as more fully described therein.

3.6 T1-R10 Pemadumcook Lake

Certain parcels of land on the shore of Pemadumcook Lake in Township T1-R10 WELS being a strip of land 200.00 feet wide extending from the High Water Line of said Lake landward and to a line at all times 200.00 feet from said high water line of said Lake.

3.6.1 Town Line to ST-50

Beginning on the southerly shore of Pemadumcook Lake on the Town Line between T1-R9 WELS and T1-R10 WELS;

Thence, southerly along said Town Line to a point that is 200.00 feet from the high water line of said Lake, the highwater line for this Lake is at MSL elevation of 491.92 feet U.S.G.S. datum;

Thence, northwesterly along a line that is always 200.00 feet from the high water line of said Lake;

Thence, along a line between two rebars set, South 66°16'50 East, to a rebar set at UTM coordinates N 16601751.55, E 1648915.61 feet on the shore of said Lake, said rebar being the point of commencement of the parcel described immediately below;

Thence, southeasterly along said high water line to the Town Line; Thence, southerly along said Town Line to the POINT OF BEGINNING.

3.6.2 ST-50 to ST-51

Beginning at a rebar set on the shore of said Lake at UTM coordinates N 16,601,600.22, E 1649260.03 feet, said rebar being, North 66°16'50" West, a distance of 376.20 feet from the point of commencement described immediately above;

Thence, along a line between two rebars, set South 66°16'50" East, to a point that is 200.00 feet from the high water line of said Lake;

Thence, northwesterly along a line that is always 200.00 feet from the high water line of said Lake; Thence, North 54°15'30" East, to a rebar set;

Thence, continuing on the same course, a distance of 141.71 feet to a rebar set on the shore of said Lake, being, North 80°57'40" West, a distance of 2802.48 feet from the point of beginning, and also being the point of commencement for the parcel described immediately below;

Thence, southeasterly along the high water line of said Lake; Thence, South 66°16'50" East, to the POINT OF BEGINNING.

3.6.3 ST-51 to ST-52

Beginning at a rebar set at UTM coordinates N 16603560.02, E 1645466.00 feet and being, North 26°29'30" West, a distance of 1528.70 feet from the point of commencement described immediately above;

Thence, South 42°07'40" West, a distance of 56.89 feet to a rebar set;

Thence, continuing on the same course to a point that is 200.00 feet from the high water line of said Lake;

Thence, northwesterly, along a line that is always 200.00 feet from the high water line of said Lake; Thence, North 48°46'50" East, to a rebar set;

Thence, continuing on the same course a distance of 145.30 feet to a rebar set and an iron pipe found on the shore of said Lake, said items being, North 53°35'10 West, a distance of 4526.15 feet from the point of beginning described immediately above, and also being the point of commencement for the parcel described immediately below;

Thence, southeasterly, to and along the high water line of said Lake to the POINT OF BEGINNING.

3.6.4 ST-52 to ST-53

Beginning at a rebar set at UTM coordinates N 16606394.54, E 1641685.26 feet, being, North 43°05'40" West, a distance of

202.40 feet from the point of commencement described immediately above; Thence, South 55°46'10" West, a distance of 71.73 feet to a rebar set;

Thence, continuing on the same course, to a point that is 200.00 feet from the high water line of said Lake;

Thence, continuing westerly and clockwise around said Lake along a line that is always 200.00 feet from the high water line of said Lake;

Thence, South 18°15'30" East, to a rebar set;

Thence, continuing on the same course, a distance of 93.01 feet to a rebar set on the shore of said Lake, being, North 23°33'10" West, a distance of 8823.74 feet from the point of beginning described immediately above, and also being the point of commencement for the parcel described immediately

below;

Thence, easterly and counterclockwise around said Lake to and along the high water line of said Lake to the POINT OF BEGINNING.

3.6.5 ST-53 to Town Line

Beginning at a rebar set on the shore of said Lake at UTM coordinates N 16614196.92, E 1639768.72 feet, and being, South 79°54'40" East, a distance of 1634.55 feet from the point of commencement described immediately above;

Thence, North 06°44'00" West, a distance of 51.51 feet to a rebar set;

Thence, continuing on the same course, to a point that is 200.00 feet from the high water line of said Lake;

Thence, easterly along a line always 200.00 feet from the high water line of said Lake to the blazed and painted Town Line between T1-R10 WELS and T1-R9 WELS;

Thence, southerly along said Town Line to a rebar set on the shore of said Lake;

Thence, westerly to and along the high water line of said Lake to the POINT OF BEGINNING.

3.6.6 Islands

Together with all islands except Islands listed in Schedule 3 attached hereto and in Section 14.3 herein, and including in this grant without limitation 14 islands identified by the following UTM coordinates in feet:

Northings Eastings

#1 16611140 1651840

#2 16610630 1651530

#3 rebar set 16609360.55 1651711.20

#4 16600170 1653210

#5 omitted

#6 16600810 1652830

#7 16600940 1652160

#8 16598730 1653020

#9 16609690 1636210

#10 16609900 1635730

#11 16610520 1635730

#12 16610810 1635960

#13 16612230 1639370

#14 16614950 1634510

#15 16599680 1652360

3.6.7 Recreation Area No. 1

A certain parcel of land situated in the Town of T1-R10, County of Piscataquis, State of Maine on the westerly shore of Pemadumcook Lake also known as Recreation Area No. 1 as shown on Exhibit G sheet 2 of 10, Penobscot Mills Project Boundary Map North Twin Development. Bounded and described more particularly as follows:

Beginning at a rebar set marking the northwest corner of said Recreation Area No. 1 at UTM coordinates of North 16611603.38 and East 1636171.79 feet;

Thence, easterly on a UTM grid bearing of North 77°47'40" East, a distance of 1614.21 feet to a rebar set on the shore of Pemadumcook Lake at North 16611944.67, East 1637749.51 feet at MSL elevation of 491.92 feet U.S.G.S. datum; Thence, in a southerly direction along the high water line;

Thence, continuing westerly with the high water line;

Thence, northerly along the high water line to the Point of Beginning. The above-described parcel of land containing 20 acres, more or less.

The above-described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham, PLS #1027, and shown on a Plat dated September 18, 2001. All bearings are UTM Grid. All monuments set were 5/8 inch metal rebar with yellow plastic caps affixed to them, with "D. Bridgham, PLS #1027" imprinted in the caps. September 20, 2001.

3.6.8 Recreation Area No. 2

A certain parcel of land situated in the Town of T1-R10, County of Piscataquis, State of Maine on the North shore of Pemadumcook Lake also known as Recreation Area No. 2 as shown on Exhibit G Sheet 2 of 10, Penobscot Mills Project Boundary Map Twin Development. Described more particularly as follows:

Beginning at a rebar set marking the northwest corner of said Recreation Area No. 2 at UTM coordinates of North 16609925.56 East 1656465.90 feet;

Thence, easterly on a UTM grid bearing of South 56°11'20" East, a distance of 997.85 feet to a rebar set on the shore of Pemadumcook Lake at North 16610480.81, East 1655636.80 feet at MSL elevation of 491.92 feet U.S.G.S. datum; Thence, westerly along the high water line;

Thence, continuing northerly along the high water line;

Thence, southerly along the high water line, to the Point of Beginning. The above-described parcel of land containing 25 acres, more or less.

The above-described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham, PLS #1027, and shown on a Plat dated September 18, 2001. All bearings are UTM Grid. All monuments set were 5/8 inch metal rebar with yellow plastic caps affixed to them, with "D. Bridgham, PLS #1027" imprinted in the caps. September 19, 2001.

3.7 Penobscot Mills Pumping Station

A certain parcel of land together with buildings and improvements situated in Township 1 Range 9, County of Piscataquis, State of Maine being known as the Penobscot Mills Pumping Station, also being part of the land now or formerly owned by GNP, bounded and described more particularly as follows: BEGINNING at a #5 rebar set and capped #1027, located at UTM coordinate 16,613,596.05 North and 1,682,013.38 East, as acquired by GPS;

Thence, North 18°53'10" West, a distance of 26.00 feet to a rebar set at UTM coordinate 16,613,575.32 North and 1,681,954.95 East, as acquired by GPS, said rebar being 20.00 feet from the centerline of the pipes according to a plan by Kleinschmidt Associates dated November 1, 1991;

Thence, parallel to said pipes, South 70°27'50" West, a distance of 347.12 feet to a rebar set on the easterly right-of-way of the State Park Road as described in Volume 403, Page 283 of the Piscataquis County Registry of Deeds in Dover Foxcroft;

Thence, across said State Park Road, South 70°27'50" West, a distance of 60.30 feet to a rebar set on the westerly right-of-way of said State Park Road;

Thence, crossing the Golden Road, South 70°27'50" West, a distance of 68.66 feet to a rebar set on the westerly edge of the Golden Road;

Thence, along said Golden Road, South 23°26'20" East, a distance of 222.97 feet to the southerly edge of the Spencer Cove boat launch;

Thence, South 73°42'30" West, a distance of 173.27 feet to a rebar set on the shore of Ambejejus Lake;

Thence, continuing, South 73°42'30" West, an approximate distance of 10 feet to the high water mark of Ambejejus Lake; Thence, in a generally northerly direction, along the high water mark of Ambejejus Lake at an elevation equal to the N.F.P.E. of 491.92 feet U.S.G.S. datum to a point being South 09°46'00" East, an approximate distance of 10 feet from a rebar set;

Thence, North 09°46'00" West, an approximate distance of 10 feet to a rebar set on the shore of the Lake, said rebar being on a tie line of, North 12°10'30" West, a distance of 601.06 feet from the last rebar mentioned;

Thence, continuing, North 09°46'00" West, a distance of 77.32 feet to a rebar set;

Thence, North 57°41'50" East, a distance of 24.04 feet to a rebar set on the westerly edge of said Golden Road; Thence, along said Road, South 25°06'30" East, a distance of 406.90 feet to a rebar set;

Thence, across the Golden Road, North 70°27'50" East, a distance of 65.95 feet to a rebar set on the westerly right-of-way of said State Park Road;

Thence, across said State Park Road, North 70°27'50" East, a distance of 60.61 feet to a rebar set on the easterly right-of-way of said State Park Road;

Thence, continuing, North 70°27'50" East, a distance of 314.28 feet to a rebar set; Thence, North 19°52'10" West, a distance of 302.00 feet to a rebar set;

Thence, North 49°43'40" East, a distance of 128.31 feet to a rebar set; Thence, South 53°06'30" East, a distance of 193.36 feet to a rebar set;

Thence, North 79°21'30" East, an approximate distance of 20 feet to the high water mark of Millinocket Lake;

Thence, in a generally southerly direction, along the high water mark of Millinocket Lake, at an elevation equal to the N.F.P.E. of

480.00 feet U.S.G.S. datum, to a point, being North 70°27'50" East, an approximate distance of 20 feet from a rebar set;

Thence, South 70°27'50" West, an approximate distance of 20 feet to a rebar set, said rebar being on a two section tie line starting from the last rebar mentioned, thence, South 02°46'10" East, a distance of 99.63 feet to a rebar set and capped #1027 set under the bend in the center conductor of the Owners electrical transmission line, thence, South 08'38'00" West, a distance of 200.69 feet to a rebar set; Thence, continuing, South 70°27'50" West, a distance of 62.00 feet to the point of beginning. The above described parcel of land containing 3.0 acres, more or less.

The above described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham, PLS #1027, and shown on a Plat dated November 24, 1999; Published August 29, 2001. All bearings are calculated from UTM Grid, NAD27 Conus Datum, Zone 19 North. UTM coordinates are expressed in feet. Location Control by Trimble XL Pro GPS, with a minimum of 600 observations. Mean Horizontal Precision is 0.538 feet. Ground traverse was performed with an EDM.

All monuments set were 5/8 inch metal rebar with yellow plastic caps affixed to them, with "D. Bridgham, PLS #1027" imprinted in the caps.

3.8 Millinocket Lake Dam

A certain Parcel of land including, without limitation, the dam and dam structures, situated in Township 1, Range 8 WELS, County of Penobscot, State of Maine, being part of land now or formerly owned by GNP. Bounded and described more particularly as follows:

BEGINNING at a 5/8 inch rebar set and capped #1027, located at UTM coordinate 16,618,361.42 North and 1,708,393.22 East; Thence, South 39°41'50" East, a distance of 242.25 feet to a rebar set, and located at UTM coordinate 16,618,175.03 North and 1,708,547.55 East;

Thence, South 57°57'20" West, a distance of 849.99 feet to a rebar set; Thence, North 17°51'50" West, a distance of 234.34 feet to a rebar set; Thence, North 56°59'10" East to the shore of Millinocket Lake;

Thence, a generally easterly direction, along the high water mark of the Lake at an elevation equal to the N.F.P.E. of 480.00 feet

U.S.G.S. datum;

Thence, North 56°59'10" East, to the point of beginning.

The above described parcel containing 3.5 acres more or less.

The above described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham PL S # 1027, and shown on a Plat, having a revised date of October 8, 1999 and published August 28, 2001. All bearings are calculated from UTM Grid, Nad27, Conus Datum, Zone 19 North. UTM coordinates are expressed in feet. Location control by Trimble XL Pro GPS, with a minimum of 600 observations. The mean Horizontal Precision is 1.01 feet. Ground traverse was performed by EDM. All monuments set are 5/8 inch metal rebar with yellow plastic caps affixed to them, with "D. Bridgham PLS # 1027" imprinted in the caps.

3.9 T1-R8, T1-R9, and T2-R9 on Millinocket Lake

Certain parcels of land on the shore of Millinocket Lake in the Townships of T1-R8, T1-R9, and T2-R9 WELS being a strip of land

200.00 feet wide extending from the High Water of said Lake landward and to a line at all times a distance of 200.00 feet from said high water mark of said Lake.

3.9.1 Northeast Corner

Beginning at a rebar set on the shore of Millinocket Lake on the painted and blazed line found between Township T1-R8 and Township T2-R8 at UTM coordinates N 16624648.80, E 1707194.74 feet;

Thence, along said Town Line, North 83°42'10" East, a distance of 286.18 feet to a rebar set being approximately a distance of

200.00 feet from the high water mark of said Lake;

Thence, southerly, easterly, and, westerly, along a line that is always a distance of 200.00 feet from the high water mark of said Lake; (See Plan ST-66)

Thence, North 31°20'40" East, to a rebar set;

Thence, continuing on the same course, a distance of 91.73 feet to a rebar set on the shore of said Lake, being, South 13°27'10" East, a distance of 5324.43 feet from the point of beginning, and also being the point of commencement for the East Side of the Dam Parcel described immediately below;

Thence, easterly, westerly and northerly, along the high water mark of said Lake to the point of beginning.

TOGETHER WITH two peninsulas extending southerly from the town line into Millinocket Lake approximately one half mile westerly of the northerly end of the parcel described immediately above.

3.9.2 Dam Site East Side (ST-67)

Beginning at a rebar set on the shore of said Lake at UTM coordinates N 16618397.74, E 1708250.55 feet, also being, South 09°40'30" West, a distance of 1088.20 feet from the point of commencement described immediately above;

Thence, North 42°33'40" East, a distance of 105.64 feet to a rebar set;

Thence, continuing on the same course to a point that is a distance of 200.00 feet from the high water mark of said Lake; Thence, southerly, always being a distance of 200.00 feet from said high water mark to the Millinocket Lake Dam Lot;

Thence, along said Dam Lot, North 39'41'50" West, a distance of 170 feet more or less to a rebar set; Thence, continuing along said Dam Lot, South 56°59'10" West, a distance of 130.00 feet more or less to the high water mark of said Lake, said point being, South 17°26'20" East, a distance of 112.31 feet from the point of beginning, and also being the point of commencement for the West Side of the Dam Parcel described immediately below;

Thence, northerly along the high water mark of said Lake to the point of beginning.

3.9.3 Dam Site West Side (ST-67)

Beginning at a point on the shore of said Lake on the northerly bound of said Lake Dam Lot, at UTM coordinates N 16,618,083.32, E 1,707,965.21 feet, and said point being, South 56°59'10" West, a distance of 380.43 feet from the point of commencement described immediately above;

Thence, continuing along said Dam Lot northerly bound, South 56°5910" West, to a point that is a distance of 200.00 feet from the high water mark of said Lake;

Thence, northerly, along a line that is always a distance of 200.00 feet from the high water mark of said Lake;

Thence, North 20°00'00" East, to a rebar set on the shore of said Lake, said point being, North 37°17'50" West, a distance of

486.22 feet from the point of beginning, and also being the point of commencement for the Parcel ST-58 described immediately below;

Thence, southerly, along the high water mark of said Lake to the point of beginning. 3.9.4 Parcel ST-58

Beginning at a rebar set on the shore of said Lake, at UTM coordinates N 16,619,676.07, E 1,697,917.40 feet, being, North 82°57'00" West, a distance of 9827.46 feet from the point of commencement described immediately above; Thence, South 70°14'10" East, a distance of 106.87 feet to a rebar set;

Thence, continuing on the same course to a point that is a distance of 200.00 feet from the high water

mark of said Lake; Thence, southwesterly and northwesterly along a line that is always a distance of 200.00 feet from the high water mark of said Lake;

Thence, North 73°56'00" East, to a rebar set;

Thence, continuing on the same course, a distance of 105.27 feet to a rebar set on the shore of said Lake, being South 56°30'10' West, a distance of 1135.22 feet from the point of beginning described immediately above, and also being the point of commencement of Parcel ST-59 described immediately below;

Thence, easterly and northeasterly, along the high water mark of said Lake to the point of beginning.

3.9.5 Parcel ST-59

Beginning at a rebar set on the shore of said Lake, at UTM coordinates of N 16,618,355.06, E 1,696,126.53 feet, and being, South 50°33'20" West, a distance of 1093.16 feet from the point of commencement described immediately above;

Thence, North 32°43'40" East, a distance of 108.07 feet to a rebar set;

Thence, continuing on the same course to a point that is a distance of 200.00 feet from the high water mark of said Lake, Thence, southwesterly and northwesterly, along a line that is always a distance of 200.00 feet from the high water mark of said Lake;

Thence, North 55°04'00" East, to a rebar set;

Thence, continuing on the same course, a distance of 102.55 feet to a rebar set on the shore of said Lake, said rebar being, South 28°51'00" West, a distance of 1832.21 feet from the point of beginning described immediately above, and also being the point of commencement for Parcel ST-62 described immediately below;

Thence, easterly and northeasterly, along the high water mark of said Lake to the point of beginning.

3.9.6 Parcel ST-62

Beginning at a rebar set on the shore of said Lake at UTM coordinates N 16,615,143.29, E 1,694,243.92 feet, and also being, South 31°51'30" West, a distance of 1891.93 feet from the point of commencement described immediately above;

Thence, North 47°14'10" East, a distance of 108.51 feet to a rebar set;

Thence, continuing on the same course to a point that is a distance of 200.00 feet from the high water mark of said Lake; Thence, easterly, southerly, and westerly, to the easterly bound of a parcel owned Fee Simple by others;

Thence, North 01°26'20" West, through a rebar set to an iron pipe found on the shore of said Lake, said iron pipe being, South 46°42'00" West, a distance of 1607.39 feet from the point of beginning and the point of commencement for Parcel ST-60 described immediately below;

Thence, easterly, northerly and westerly, along the high water mark of said Lake to the point of beginning.

3.9.7 Parcel ST-60

Beginning at a rebar set on the shore of said Lake at UTM coordinates N 16,611,146.53, E 1,688,386.32 feet, being South 58°18'30" West, a distance of 5509.37 feet from the point of commencement described immediately above;

Thence, South 05°30'00" East, a distance of 106.80 feet to a rebar set;

Thence, continuing on the same course to a point that is a distance of 200.00 feet from the high water mark of said Lake; Thence, northwesterly along a line that is always a distance of 200.00 feet from the high water mark of said Lake; Thence, South 86°39'50" East, to a rebar set;

Thence, continuing on the same course, a distance of 79.99 feet to a rebar set on the shore of said Lake, being, North 49°13'30" West, a distance of 1008.31 feet from the point of beginning, and also being the point of commencement for Parcel ST-68 described immediately below;

Thence, southeasterly along the high water mark of said lake to the point of beginning.

3.9.8 Parcel ST-68

Beginning at a rebar set at UTM coordinates of N 16,613,927.12, E 1,681,786.15 feet, and being, North 63°51'40" West, a distance of 3432.82 feet from the Town Line rebar set between T1-R9 and T1-R8, which is, North 76°00'10" West, a distance of 2870.70 from the point of commencement described immediately above;

Thence, South 19°52'10" East, to a point a distance of 200.00 feet from the high water mark of said Lake; Thence, westerly, northerly, and then easterly always staying a distance of 200.00 feet from the high water mark of said Lake;

Thence, South 43°16'40" East, to a rebar set near the shore of the Lake, said rebar being North 07°55'10" East, a distance of

380.26 feet from the point of beginning, also being the point of commencement of the next parcel described immediately below; Thence, continuing to the high water mark;

Thence, westerly, southerly, and easterly along said high water mark; Thence, South 19°52'10" East, to the point of beginning.

3.9.9 Big Parcel in T1-R9

Beginning at a rebar set on the shore of said Lake at UTM coordinates of N 16,614,749.61, E 1,681,917.50 feet, also being, North 22°23'50" East, a distance of 482.24 feet from the point of commencement described immediately above;

Thence, South 63°37'40" West, in the direction of another rebar set to a point that is a distance of 200.00 feet from the high water mark of said Lake;

Thence, northerly, westerly, and easterly always 200.00 feet from the high water mark of said Lake to the Town Line between T1- R8 and T1-R9;

Thence, along said Town Line, South 00°06'10" West, to a rebar set on the shore of said Lake, said rebar being, North 25°55'30" East, a distance of 6937.83 feet from the point of beginning, said rebar also being the point of beginning for the next parcel described below;

Thence, westerly, southerly, and easterly along said high water mark to the point of beginning.

3.9.10 Small Parcel in T1-R8 on the West Shore

Beginning at the rebar described immediately above at UTM coordinates N 16,620,989.20, E 1,684,950.82 feet;

Thence, along said Town Line, North 00°06'10" West, to a point that is a distance of 200.00 feet from the high water mark of said Lake;

Thence, easterly, northerly, and westerly always 200.00 feet from the high water mark of said Lake to said Town Line;

Thence, North 00°06'10" West, to a rebar set on the shore of said Lake, being North 00°06'10" West, a distance of 2437.66 feet from the point of beginning described immediately above and also being the point of beginning for the next parcel described immediately below;

Thence, easterly, southerly, and westerly, along said high water mark to the point of beginning.

3.9.11 Parcel in T1-R9 WELS and T2-R9 WELS on the West Shore

Beginning at a rebar set as described immediately above at UTM coordinates N 16,623,426.85, E 1,684,946.47 feet;

Thence, South 00°06'10" East, along said Town Line to a point that is a distance of 200.00 feet from the high water mark of said Lake;

Thence, northwesterly and northeasterly, along a line that is always a distance of 200.00 feet from the high water mark of said Lake across the Town Line between T1-R9 WELS and T2-R9 WELS to the Town Line between T2-R9 WELS and T2-R8 WELS; Thence, along said Town Line, South 09°16'20" East, to a rebar set;

Thence, continuing on the same course, a distance of 99.54 feet to a rebar set on the shore of said Lake, said point being, North 00°10'50 West, a distance of 11115.82 feet from the point of beginning;

Thence, southwesterly and southeasterly, along the high water mark of said Lake crossing the Town Line between T2-R9 WELS and T1-R9 WELS to the point of beginning.

3.9.12 Islands

Together with all islands except Islands listed in Schedule 3 attached hereto and in Section 14.3 herein, and including within this grant without limitation 16 islands identified by the following UTM coordinates in feet:

Northings Eastings

#1 16622630 1706580

#2 16620560 1707560

#3 16619400 1697220

#4 16619920 1696500

#5 16618920 1695700

#6 16617680 1695580

#7 16618120 1693980

#8 16616460 1693790

#9 16620590 1690780

#10 16620130 1687870

#11 16618280 1686390

#12 16617900 1686740

#13 16614180 1687620

#14 16613530 1687900

#15 16617480 1683940

#16 16615550 1682230

3.10 Millinocket Mill

3.10.1 Millinocket Mill Site - Intentionally omitted

3.10.2 Little Italy Substation Millinocket Mill - Millinocket, Maine

(a) An exclusive Hydroelectric Easement located upon, over, under, through and across the following described parcel, with the exception of the Easement Exception Areas specifically identified below, and

(b) a blanket easement as described in that certain blanket cross easement deed and agreement from GNP to GNE of dated January 31, 2002 and recorded in the Penobscot County Registry of Deeds in Book 8064, Page 241, covering portions of the Millinocket Mill site:

A certain lot or parcel of land with improvements thereon situated within the Great Northern Paper Company Mill lot in the Town of Millinocket, County of Penobscot State of Maine and being more particularly described as follows:

Beginning at a point at or near a fence corner of the most northerly corner of an electrical sub-station, said point is located at coordinates N: 722,438.7 feet, E: 932,241.6 feet; coordinates are referenced to the Maine State Coordinate System, East Zone, NAD 83, and are intended to establish the approximate location of said beginning point;

Thence S 41° 16' 11" E by and along said chain link fence, a distance of 26.44 feet to an angle point in said fence; Thence S 31° 53' 38" E by and along said chain link fence, a distance of 11.06 feet to an angle point in said fence; Thence S 19° 18' 10" E by and along said chain link fence, a distance of 93.99 feet to an angle point in said fence;

Thence S 38° 31' 45" E by and along said chain link fence, a distance of 158.96 feet to an angle point in said fence, said point is further described as being the most easterly corner of said sub-station;

Thence S 51° 37' 37" W by and along said chain link fence, a distance of 88.21 feet to an angle point in said fence; Thence S 76° 24' 55" W by and along said chain link fence, a distance of 64.08 feet to an angle point in said fence; Thence N 38° 37' 47" W by and along said chain link fence, a distance of 94.87 feet to an angle point in said fence; Thence N 51° 58' 15" E by and along said chain link fence a distance of 6.31 feet to the southwesterly side of a building;

Thence N 38° 35' 13" W by and along the southwesterly side of said building, a distance of 14.69 feet to most westerly corner of said building;

Thence N 51° 17' 04" E by and along the northwesterly side of said building, a distance of 30.88 feet to the most northerly corner of said building;

Thence S 38° 35' 13" E by and along the northeasterly side of said building, a distance of 14.69 feet to chain link fence; Thence N 50° 30' 28" E by and along said chain link fence, a distance of 8.02 feet to an angle point in said fence; Thence N 37° 17' 43" W by and along said chain link fence, a distance of 36.31 feet to an angle point in said fence;

Thence N 02° 29' 16" W by and along said chain link fence, a distance of 17.23 feet to an angle point in said fence; Thence N 39° 10' 19" W by and along said chain link fence, a distance of 81.47 feet to the southeasterly side of a building;

Thence S 50° 35' 09" W by and along the southeasterly side of said building 9.83 feet to most southerly corner of said building; Thence N 38° 52' 39" W by and along the southwesterly side of said building, a distance of 12.72 feet to most westerly corner of said building;

Thence N 51° 07' 14" E by and along the northwesterly side of said building, a distance of 9.82 feet to the a chain link fence; Thence N 38° 52' 46" W by and along said chain link fence, a distance of 17.18 feet to an angle point in said fence;

Thence N 50° 52' 36" E by and along said chain link fence, a distance of 122.42 feet to point of beginning.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet, E: 977,164.59 feet which are based on the 1992 readjustment.

3.10.3 Power Station

Millinocket Mill - Millinocket, Maine

(a) An exclusive Hydroelectric Easement located upon, over, under, through and across the following described parcel, with the exception of the Easement Exception Areas specifically identified below, and

(b) a blanket easement as described in that certain blanket cross easement deed and agreement from GNP to GNE of dated January 31, 2002 and recorded in the Penobscot County Registry of Deeds in Book 8064, Page 241, covering portions of the Millinocket Mill site:

A certain lot or parcel of land with buildings and improvements thereon situated within the Great Northern Paper Company Mill lot in the Town of Millinocket, County of Penobscot State of Maine and being more particularly described as follows:

Beginning at a point at or near the northwesterly corner of the Power Station, said point is located at coordinates N: 722,093.9 feet, E: 931,761.4 feet; coordinates are referenced to the Maine State Coordinate System, East Zone, NAD 83, and are intended to establish the approximate location of the beginning point;

Thence N 51° 09' 52" E by and along said power station foundation, a distance of 175.59 feet to the most northerly building corner of said Power Station;

Thence continuing on the same course N 51° 09' 52" E, a distance of 77.31 feet to a point at or near the northeasterly face of a retaining wall;

Thence S 38° 57' 48" E by and along said retaining wall, a distance of 23.93 feet to a point near the corner of said retaining wall; Thence S 52° 15' 29" W by and along said retaining wall, a distance of 77.33 feet to a point on the northeasterly side of said Power Station foundation;

Thence S 38° 57' 48" E by and along said building foundation of the northeasterly wall of the said Power Station, a distance of

239.60 feet to the most easterly corner of said Power Station;

Thence S 50° 58' 14" W by and along the southeasterly foundation wall of said Power House, a distance of 175.29 feet to the most southerly building corner of said Power Station;

Thence N 39° 01' 46" W by and along said building foundation of the southwesterly side of said Power Station, a distance of

262.65 feet to the point of beginning.

Bearings referenced in the above description were computed from a traverse established for a survey

of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet, E: 977,164.59 feet which are based on the 1992 readjustment.

3.10.4 New Substation - Intentionally omitted.

3.10.5 Substation No. 4 Parcel Millinocket Mill Site

A certain lot or parcel of land with the improvements situated in Millinocket, Penobscot County, Maine more particularly described as follows:

Beginning at a point on the southwesterly line of the Ferguson Canal parcel, so called, which point is also the point of beginning of the Easement Area 2, so called, said point of beginning is further described as being at coordinates N: 721,100.57 feet and E: 931,005.98 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence S 50° 32' 25" W by and along a line that lies on the southeasterly side of the road running to said Stone Dam, which line is also the northwesterly line of the parcel herein described, a distance of 282.35 feet to the most westerly corner of the parcel herein described;

Thence S 50° 35' 19" E, a distance of 39.71 feet to a point further described as having coordinates N: 720,895.91 feet and E: 930,818.67 feet according to the aforementioned coordinate system;

Thence S 50° 35' 19" E, a distance of 391.64 feet to the westerly most corner of a chain link fence that surrounds the sub-station on the parcel herein described;

Thence S 57° 48' 57" E by and along said chain link fence, a distance of 108.74 feet to a point on said chain link fence, said point is further described as being a point on Easement Area 1, said point is further described as having coordinates N: 720,621.56 feet E: 931,174.08 according to aforementioned coordinate system;

Thence continuing on the same bearing S 57° 48' 57" E by and along said chain link fence and Easement Area 1, a distance of

100.00 feet to a corner of said fence;

Thence N 31° 49' 10" E by and along said chain link fence and Easement Area 1, a distance of 215.04 feet to a corner of said fence;

Thence continuing on the same bearing N 31° 49' 10" E, a distance of 93.87 feet to a point; Thence N 47° 44' 30" W, a distance of 130.00 feet to a point;

Thence N 34° 04' 08" W, a distance of 205.00 feet to a point;

Thence N 2° 22' 44" E, a distance of 74.28 feet to a point on the said Ferguson Canal Parcel;

Thence S 58° 01' 04" W, by and along said Ferguson Canal Parcel a distance of 157.50 feet to an angle point on the said Ferguson Canal Parcel;

Thence N 73° 37' 40" W, by and along said Ferguson Canal Parcel a distance of 77.17 feet to the point of beginning. Sub-Station No. 4 contains 4.30 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated

MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

3.10.6 Frequency Converter Parcel Millinocket Mill Site

(a) An exclusive Hydroelectric Easement located upon, over, under, through and across the following described parcel, with the exception of the Easement Exception Areas specifically identified below, and

(b) a blanket easement as described in that certain blanket cross easement deed and agreement from GNP to GNE of dated January 31, 2002 and recorded in the Penobscot County Registry of Deeds in Book 8064, Page 241, covering portions of the Millinocket Mill site:

A certain lot or parcel of land with improvements situated in Millinocket, Penobscot County, Maine more particularly described as follows:

Beginning-at a point on the Easement Area 1, so called, said point of beginning is further described as having coordinates N: 721,102.77 feet and E: 931,235.17 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence S 38° 08' 00" E by and along a northeasterly line of said Easement Area 1, a distance of 155.00 feet to a point; Thence N 51° 52' 00" E by and along a northwesterly line of said Easement Area 1 Parcel, a distance of 102.00 feet to a point; Thence N 38° 08' 00" W, a distance of 155.00 feet to a point;

Thence S 51° 52' 00"W, a distance of 102.00 feet to the point of beginning. The Frequency Converter Parcel contains 0.36 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

3.10.7 Substation No. 2-3 Parcel Millinocket Mill Site

(a) An exclusive Hydroelectric Easement located upon, over, under, through and across the following described parcel, with the exception of the Easement Exception Areas specifically identified below, and

(b) a blanket easement as described in that certain blanket cross easement deed and agreement from GNP to GNE of dated January 31, 2002 and recorded in the Penobscot County Registry of Deeds in Book 8064, Page 241, covering portions of the Millinocket Mill site:

A certain lot or parcel of land with improvements situated in Millinocket, Penobscot County, Maine more particularly described as follows:

Beginning at a point on the Easement Area 1, so called, said point of beginning is further described as having coordinates N: 721,027.11 feet and E: 931,484.74 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence S 38° 24' 42" E by and along a northeasterly line of said Easement Area 1, a distance of 223.08 feet to a point; Thence N 51° 04' 29" E by and along a northwesterly line of said Easement Area 1, a distance of 54.00 feet to a point; Thence N 39° 26' 20" W, by and along a southwesterly line of said Easement Area 1, a distance of 61.56 feet to a point; Thence continuing on the same bearing N

39° 26' 20" W, a distance of 161.52 feet to point;

Thence S 51° 04' 29" W, a distance of 50.00 feet to the point of beginning. The Substation 2-3 Parcel contains 0.27 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

3.10.8 T33 Transformer Parcel Millinocket Mill Site

(a) An exclusive Hydroelectric Easement located upon, over, under, through and across the following described parcel, with the exception of the Easement Exception Areas specifically identified below, and

(b) a blanket easement as described in that certain blanket cross easement deed and agreement from GNP to GNE of dated January 31, 2002 and recorded in the Penobscot County Registry of Deeds in Book 8064, Page 241, covering portions of the Millinocket Mill site:

A certain lot or parcel of land with improvements situated in Millinocket, Piscataquis County, Maine more particularly described as follows:

Beginning at a point on the Easement Area 1, so called, said point of beginning is further described as having coordinates N:

720,966.41 feet and E: 931,675.15 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence S 36° 38' 49" E by and along a northeasterly line of said Easement Area 1, a distance of 48.00 feet to a point; Thence N 53° 21' 11" E a distance of 40.00 feet to a point;

Thence N 36° 38' 49" W a distance of 48.00 feet to a point;

Thence S 53° 21' 11" W, a distance of 40.00 to the point of beginning. The T33 Transformer Parcel contains 0.04 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

3.10.9 Penstock Easement Easement Area 5 Millinocket Mill Site

(a) An exclusive Hydroelectric Easement located upon, over, under, through and across the following described parcel, with the exception of the Easement Exception Areas specifically identified below, and

(b) a blanket easement as described in that certain blanket cross easement deed and agreement from GNP to GNE of dated January 31, 2002 and recorded in the Penobscot County Registry of Deeds in Book 8064, Page 241, covering portions of the Millinocket Mill site:

A certain lot or parcel of land with improvements situated in Millinocket, Penobscot County, Maine more particularly described as follows:

Beginning at a point on the northeasterly line of the Ferguson Canal Parcel, so called, which point is northeasterly of the Head Gate House, so called, said point of beginning is further described as being at coordinates N: 721,356.89 feet and E: 931,231.59 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American

Datum of 1983 (NAD 83);

Thence N 52° 31' 35" E, a distance of 875.98 feet to the most southerly corner of the Power Station Parcel, so called;

Thence N 39° 01' 46" W by and along the southwesterly line of said Power Station Parcel, a distance of 214.28 feet to a point on said line;

Thence S 52° 31' 35" W, a distance of 881.31 feet to a point on the northeasterly line of the Ferguson Canal Parcel;

Thence S 40° 27' 15" E by and along the northeasterly line of said Ferguson Canal Parcel, a distance of 214.49 feet to the point of beginning. Penstock Easement Area 5 contains 4.32 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

3.10.10 Millinocket Easement Exception Areas 3.10.10.1. Easement Exception Area "A"

Oil Storage Tanks Millinocket Mill Site

Beginning at a point on the northerly line of Easement Area 1, so called, having coordinates of N:719,974.10 feet and E: 933,044.77 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence N 55° 19' 53" E, a distance of 228.63 feet to a point; Thence N 34° 40' 07" W, a distance of 140.92 feet to a point; Thence N 36° 39' 44" E, a distance of 149.89 feet to a point; Thence N 58° 08' 22" E, a distance of 191.75 feet to a point; Thence N 65° 37' 10" W, a distance of 399.04 feet to a point; Thence N 42° 21' 31" W, a distance of 120.86 feet to a point; Thence N 80° 22' 18" W, a distance of 383.03 feet to a point; Thence S 73° 22' 23" W, a distance of 180.33 feet to a point;

Thence N 75° 22' 07" W, a distance of 227.85 feet to a point; Thence S 56° 28' 09" E, a distance of 226.35 feet to a point; Thence S 36° 14' 52" E, a distance of 460.18 feet to a point; Thence S 50° 28' 45" W, a distance of 203.63 feet to a point;

Thence S 73° 17' 04" E, a distance of 576.18 feet to the point of beginning. Easement Exception Area "A" contains 10.756 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

3.10.10.2 Easement Exception Area "B"

(Mill Site Southerly to the West Branch of the Penobscot River) Millinocket Mill Site

Beginning at a point on the southwesterly line of Easement Area 7, so called, at its intersection with the southerly line of Easement Area 1, so called, said point having coordinates of N: 719,628.40 feet and E: 935,842.27 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence S 88° 13' 35" W, a distance of 2951.57 feet to a point; Thence N 1° 46' 25" W, a distance of 140.40 feet to a point; Thence N 74° 01' 20" W, a distance of 540.56 feet to a point; Thence N 59° 32' 41" W, a distance of 1103.35 feet to a point;

Thence N 45° 48' 30" W, a distance of 338.76 feet to a point on a chain link fence said point being further described as a point on the southwesterly line Sub-Station No. 4, said point is further described as being located at coordinates of N: 720,621.56 feet and E: 931,174.08 according to aforementioned coordinate system;

Thence N 57°48' 57" W by and along said chain link fence, a distance of 108.74 feet to a corner of said fence;

Thence N 50° 35' 19" W, a distance of 340.90 feet to a point being the southeasterly corner of Easement Area 4, so called, said point having coordinates of N: 720,895.91 feet and E: 930,818.67 feet, according to aforementioned coordinate system; Thence S 49°13' 53" W, a distance of 42.79 feet to a point;

Thence S 49° 00' 52" W, a distance of 288.23 feet to a point; Thence S 56° 04' 37" W, a distance of 110.43 feet to a point; Thence S 18° 32' 03" W, a distance of 28.91 feet to a point; Thence S 48° 27' 21" W, a distance of 147.01 feet to a point; Thence S 44° 00' 30" W, a distance of 746.57 feet to a point; Thence S 62° 19' 46" W, a distance of 450.69 feet to a point; Thence S 53° 33' 03" W, a distance of 152.67 feet to a point; Thence S 41° 32' 21" W, a distance of 128.46 feet to a point; Thence S 24° 52' 06" W, a distance of 293.05 feet to a point; Thence S 14° 25' 23" W, a distance of 309.69 feet to a point; Thence S 38° 08' 40" W, a distance of 319.14 feet to a point; Thence S 61° 10' 40" W, a distance of 153.45 feet to a point;

Thence S 72° 25' 30" W, a distance of 148.60 feet to a point on the Stone Dam Parcel, so called;

Thence S 2° 08' 12" E by and along said Stone Dam Parcel, a distance of 4.61 feet to an angle point in said line; Thence S 61° 53' 43" W by and along said Stone Dam Parcel, a distance of 145.68 feet to an angle point in said line; Thence S 76° 10' 55" W by and along said Stone Dam Parcel, a distance of 118.06 feet to an angle point in said line;

Thence N 82° 02' 56" W by and along said Stone Dam Parcel, a distance of 54.14 feet to its intersection with Easement Area 4, so called;

Thence S 72° 25' 30" W, a distance of 78.92 feet to a point; Thence N 69° 39' 41" W, a distance of 160.69 feet to a point; Thence N 64° 32' 46" W, a distance of 742.30 feet to a point;

Thence N 66° 39' 15" W, a distance of 74.36 feet to a point on the Stone Dam Parcel, so called;

Thence S 75° 45' 01" W by and along said Stone Dam Parcel, a distance of 983.20 feet to an angle point in said line;

Thence N 82° 35' 20" W by and along said Stone Dam Parcel, a distance of 16.89 feet to its intersection with Easement Area 4, so called;

Thence S 63° 57' 44" W, a distance of 40.87 feet to a point; Thence S 89° 04' 15" W, a distance of 104.50 feet to a point;

Thence N 74° 20' 20" W, a distance of 64.29 feet to the southwesterly end of said Easement Area 4;

Thence S 56° 38' 27" W, a distance of 52.71 feet, more or less, to the thread of the West Branch of the Penobscot River and the town line between the Town of Millinocket and T3 Indian Purchase;

Thence in a general southeasterly and southerly direction, by and along the thread of said river, a distance of 5900 feet, more or less, to the northerly boundary of the Back Channel Wildlife Parcel, so called;

Thence N 76° 51' 44" E by and along said Back Channel Wildlife Parcel boundary, a distance of 2320 feet, more or less, to an angle point in said line;

Thence S 74° 49' 13" E by and along said Back Channel Wildlife Parcel boundary, a distance of 8703 feet, more or less, to the thread of the West Branch of the Penobscot River and the town line between the Town of Millinocket and T3 Indian Purchase; Thence in a general northeasterly direction, by and along the thread of said river, a distance of 4480 feet, more or less, to its intersection with the southerly boundary of Easement Area 7, so called;

Thence N 50° 32' 17" W by and along said Easement Area 7, a distance of 427 feet, more or less, to an angle point in said line; Thence N 54° 48' 17" W by and along said Easement Area 7, a distance of 3245.39 feet to an angle point in said line;

Thence N 35° 11' 55" E by and along said Easement Area 7, a distance of 252.73 feet to an angle point in said line;

Thence N 54° 48' 05" W by and along said Easement Area 7, a distance of 2125.62 feet to the point of beginning. Easement Area "B" contains 1490 acres, more or less.

Bearings referenced in the above descriptions were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

3.11 Millinocket (Central Street Woodlands Office):

A certain lot or parcel of land, together with buildings and improvements situated in Millinocket, Penobscot County, Maine more particularly described as follows:

The westerly portion of Lot #1, Block 202 (153' 4" x 400') shown in Plan Book 20, Page 11, and more particularly described in a deed from Barnett Enterprises, Inc., dated September 10, 1974, recorded in Book 2490, Page 178 on September 12, 1974, situated in the Town of Millinocket, County of Penobscot, and State of Maine, and further described as follows:

Beginning at an iron pin located at the northwesterly corner of land now or formerly of GNP, being Lot numbered one (1), in Block numbered two hundred two (202) as laid down on a Plan of Land of Great Northern Paper Company at said Millinocket, and recorded in the Penobscot County Registry of Deeds, Plan Book 20, Page 11;

thence S 66° 14' 00" E a distance of 153.33 feet to an iron pin; thence S 23° 46' 00" W a distance of 400.00 feet to an iron pin; thence N 66° 14' 00" W distance of 153.33 feet to an iron pin; thence N 23° 46' 00" E a distance of 400.00 feet to the point of beginning.

3.12 Back Channel Wildlife Management Area T3 Indian Purchase and Millinocket, Maine

A certain lot or parcel of land with improvements situated southeasterly of Quakish Lake in the Town of Millinocket and Township 3, Indian Purchase, County of Penobscot, State of Maine and being more particularly described as follows:

Beginning at an iron rod easterly of a gravel road, said rod having coordinates N: 714,665.82 feet, E: 922,766.80 feet, said coordinates referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence S 1° 52' 41" W, a distance of 3,841.73 feet to an iron rod easterly of said gravel road; Thence N 88° 58' 08" E, a distance of 4,574.95 feet to an iron rod;

Thence S 29° 25' 40" E, a distance of 4,785 feet, more or less, to the northerly line of Hopkins Academy Grant;

Thence in a general easterly direction, by and along the northerly line of said Hopkins Academy Grant, a distance of 11,433 feet, more or less to the thread of Trapper Brook, so called;

Thence in a general northerly direction, by and along the thread of said Trapper Brook, a distance of 4,040 feet, more or less, to the thread of the West Branch of the Penobscot River at coordinate N: 712,455.27 feet, E: 939,206.00 feet, said coordinates are intended to identify the location of the boundary line and may not be at the physical location as defined;

Thence N 74° 49' 13" W, crossing into the Town of Millinocket, a distance of 8,703 feet, more or less, to a point on the southerly boundary of the Millinocket mill site, said point having coordinates N: 714,734.10 feet, E: 930,806.73 feet;

Thence S 76° 51' 44" W by and along said mill boundary, a distance of 2,320 feet, more or less, to the thread of the West Branch of the Penobscot River:

Thence in a general westerly and northwesterly direction, by and along the thread of the West Branch of the Penobscot River, a distance of 6,160 feet, more or less, to the intersection of this line with the southerly boundary of the Stone Dam Parcel;

Thence N 65° 12' 23" W, by and along said southerly boundary, crossing into Township 3, Indian Purchase, a distance of 50 feet, more or less, to an angle point in said boundary;

Thence S 41° 54' 50" W by and along said boundary, a distance of 1,145.45 feet to a point;

Thence N 48° 05' 10" W by and along said boundary, a distance of 21.71 feet to a point, said point being located S 9° 23' 06" W, a distance of 135.50 feet from a pk nail in the southwesterly end of said Stone Dam;

Thence S 9° 23' 06" W, a distance of 3,085.49 feet to a point;

Thence S 82° 13' 59" W, a distance of 1,808.71 feet to the point of beginning. Containing 2,350 acres, more or less.

EXCEPTING a certain parcel of land containing approximately 0.92 acres just north of Nollesemic Stream on the shore of Shad Pond and described in lease to Ryan W. Robbins (Lease No. 82).

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet, E: 977,164.59 feet which are based on the 1992 readjustment.

3.13 East Millinocket Mill Site Dam Parcel

Substation Parcels

(a) A Hydroelectric Easement located upon, over, under, through and across the following described parcels, with the exception of the Easement Exception Areas specifically identified below, and

(b) a blanket easement as described in that certain Blanket Cross Easement Deed and Agreement between Great Northern Paper, Inc. and GNE, LLC dated January 31, 2002 and recorded in the Penobscot County Registry of Deeds in Book 8064, Page 241, and covering a portion of the East

Millinocket Mill site:

3.13.1. East Millinocket Dam

An exclusive Hydroelectric Easement located upon, over, under, through and across a certain lot or parcel of land being a portion of the East Millinocket mill site in the Town of East Millinocket, County of Penobscot, State of Maine and being more particularly described as follows:

Beginning at the outside corner of a brick building at the northerly end of the dam at East Millinocket with coordinates of N: 712,766.31 feet and E: 964,925.90 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence N 26° 49' 07" E by and along the side of the said building, a distance of 4.48 feet to an inside corner of said building; Thence S 63° 23' 29" E by and along the side of said building, a distance of 27.79 feet to an outside corner of said building; Thence N 26° 48' 08" E by and along the side of said building, a distance of 0.66 feet to a point at or near the edge of a concrete retaining wall;

Thence S 63° 12' 08" E through the wall of an adjacent building and approximately along and beyond a concrete wall, a distance of

121.80 feet to a point that is on the approximate extension northeasterly of the down stream face of the power house building; Thence S 26° 28' 32" W, by and along said exterior wall, a distance of 27.00 feet to an inside corner of a brick wall;

Thence S 63° 31' 28" E by and along the side of said building, a distance of 17.30 feet to an outside corner of said building; Thence N 26° 23' 29" E by and along the side of said building, a distance of 21.13 feet to an inside corner of said building; Thence S 63° 16' 08" E a distance of 39.42 feet to another exterior wall of said building;

Thence S 29° 26' 02" W by and along the side of said building, a distance of 6.44 feet to an outside corner of said building; Thence S 63° 16' 08" E by and along the side of said building, a distance of 65.98 feet to an inside corner of said building; Thence S 24° 59' 05" W by and along the side of said building, a distance of 15.57 feet to an outside corner of said building; Thence S 62' 57' 12" E by and along the side of said building, a distance of 68.70 feet to an outside corner of said building; Thence N 26° 39' 25" E, a distance of 16.5 feet;

Thence S 63° 20' 35" E, a distance of 43.90 feet to a side of said building;

Thence S 26° 39' 25" W by and along the side of said building, a distance of 22.90 feet to an outside corner of said building; Thence S 63° 20' 35" E by and along the side of said building, a distance of 38.49 feet to an outside corner of said building; Thence S 76° 32' 03" E, a distance of 238.36 feet to the southeasterly corner of a chain link fence surrounding a sub-station; Thence N 27° 20' 25" E approximately along and on an extension of said sub-station fence, a distance of 114.85 feet to a point; Thence S 71° 34' 45" E, a distance of 285.00 feet to a point;

Thence S 17° 18' 05" W crossing the northerly bank of said river easterly of the East Millinocket dam, a distance of 459 feet, more or less, to the thread of said river and the town line between East Millinocket and TA, R7, WELS;

Thence in a general westerly direction, by and along said town line and crossing the East Millinocket Dam, a distance of 1025 feet, more or less, to a point on the boundary of the East Millinocket and Dolby Dam Parcel, so called;

Thence N 27° 16' 50" E by and along said boundary, crossing the impoundment behind said dam, a distance of 362 feet, more or less, to the point of beginning. The above described parcel contains 8.4 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

3.13.2 Electric Substation 1 (Easterly of Dam) East Millinocket

A certain lot or parcel of land being a portion of the East Millinocket mill site in the Town of East Millinocket, County of Penobscot, State of Maine and being more particularly described as follows: Beginning at a point on the northerly boundary of the East Millinocket and Dolby Dam Parcel, so called, at the southeasterly corner of a chain link fence surrounding an electric substation, having coordinates: N: 712,494.01 feet and E: 965,522.76 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence N 76° 32' 03" W, a distance of 93.37 feet to a point;

Thence N 27° 12' 38" E, a distance of 64.38 feet to a point; Thence S 82° 48' 47" E, a distance of 96.72 feet to a point;

Thence S 27° 20' 25" W, a distance of 75.31 feet to the point of beginning. The above described parcel contains 0.146 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

3.13.3 Electric Substation 3 (Westerly of Dam) East Millinocket

A certain lot or parcel of land being a portion of the East Millinocket mill site in the Town of East Millinocket, County of Penobscot, State of Maine and being more particularly described as follows: Beginning at a point on the northerly shore of the West Branch of the Penobscot River, said point being located 450 feet, more or less, westerly from the northwest end of the dam, said point having coordinates: N: 712,893.85 feet and E: 964,534.80 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence in a general westerly direction, by and along said shore line, a distance of 145 feet, more or less, to a point on said shore, said point being located N 81° 26' 36" W, a distance of 143.23 feet from the point of beginning;

Thence N 26° 16' 04" E, a distance of 143.12 feet to a point; Thence S 65° 26' 01" E, a distance of 136.50 feet to a point;

Thence S 26° 16' 04" W, a distance of 103.60 feet to the point of beginning. The above described parcel contains 0.4 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

3.13.4 East Millinocket Easement Exception Areas 3.13.4.1 Easement Exception Area "A" (Wastewater Treatment Facility)

East Millinocket Mill

A certain lot or parcel of land being a portion of the East Millinocket mill site in the Town of East Millinocket, County of Penobscot, State of Maine and being more particularly described as follows:

That portion of said East Millinocket Mill Site situated easterly of the following described line:

Beginning at a point on the southerly right of way line of the Bangor and Aroostook Railroad, said point having coordinates N: 713,105.65 feet and E: 966,651.66 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence S 33° 55' 21" W, a distance of 1069 feet, more or less, to a point on the northerly shore of the West Branch of the Penobscot River. Easement Exception Area "A" contains 44 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

3.13.4.2 Easement Exception Area "B" (Area North and East of Training Center) East Millinocket Mill

A certain lot or parcel of land being a portion of the East Millinocket mill site in the Town of East Millinocket, County of Penobscot, State of Maine and being more particularly described as follows: Beginning at a point easterly of the training center, so called, having coordinates N: 712,895.05 feet and E: 966,396.13 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence N 70° 57' 58" W, a distance of 557.43 feet to a point; Thence S 18° 54' 26" W, a distance of 154.50 feet to a point; Thence S 83° 28' 30" E, a distance of 217.80 feet to a point; Thence S 22° 13' 33" E, a distance of 119.17 feet to a point;

Thence N 72° 30' 29" E, a distance of 330.85 feet to the point of beginning. Easement Exception Area "B" contains 1.515 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

3.13.4.3 Easement Exception Area "C" (Area Southwesterly of Training Center) East Millinocket Mill

A certain lot or parcel of land being a portion of the East Millinocket mill site in the Town of East Millinocket, County of Penobscot, State of Maine and being more particularly described as follows: Beginning at a point northwesterly of the training center, so called, having coordinates N: 712,890.88 feet and E: 965,789.46 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence S 43° 54' 26" W, a distance of 355.01 feet to a point; Thence S 52° 46' 35" E, a distance of 50.14 feet to a point; Thence N 67° 24' 33" E, a distance of 298.48 feet to a point;

Thence N 22° 00' 46" W, a distance of 184.92 feet to the point of beginning. Easement Exception Area

"C" contains 0.836 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment

3.13.4.4 Easement Exception Area "D" (Recycle Fiber Plant and Storage Tanks) East Millinocket Mill

Two certain lots or parcels of land being a portion of the East Millinocket mill site in the Town of East Millinocket, County of Penobscot, State of Maine and being more particularly described as follows:

Beginning at a point on the southerly right of way line of the Bangor and Aroostook Railroad, easterly a crossing located northwesterly of the Recycle Fiber Plant, so called, said point having coordinates N: 714,482.96 feet and E: 963,621.18 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence S 27° 49' 27" E, a distance of 494.42 feet to a point;

Thence S 50° 48' 45" E, a distance of 425.47 feet to a point; Thence S 66° 32' 25" E, a distance of 578.56 feet to a point;

Thence N 88° 51' 50" E, a distance of 514.90 feet to a point westerly of the main mill entrance; Thence N 32° 24' 38" W, running westerly of said entrance, a distance of 282.10 feet to a point;

Thence N 53° 45' 03" W, a distance of 79.58 feet to a point on said Bangor and Aroostook Railroad right of way; Thence S 20° 39' 06" W by and along said right of way, a distance of 50.82 feet to a point;

Thence in a general westerly direction by and along said right of way on a non-tangent curve to the right with a radius of 1532.69 feet an arc distance of 300.13 feet to a point, said curve having a chord bearing N 70° 10' 25" W and a chord distance of 299.65 feet;

Thence S 25° 30' 51" W by and along said right of way a distance of 44.91 feet to a point; Thence N 50° 50' 39" W by and along said right of way, a distance of 461.00 feet to a point;

Thence N 62° 42' 55" W by and along said right of way, a distance 510.00 feet to a point of curvature;

Thence in a general westerly direction by and along said right of way on a tangent curve to the left with a radius of 1383.19 feet an arc distance of 280.73 feet to the point of beginning. The above described parcel contains 11.533 acres, more or less.

ALSO another parcel of land being a portion of the East Millinocket mill site in the Town of East Millinocket, County of Penobscot, State of Maine and being more particularly described as follows: Beginning at a point on the southerly right of way line of the Bangor and Aroostook Railroad, said point having coordinates N: 713,811.26 feet and E: 965,170.45 feet;

Thence S 53° 59' 21" W, a distance of 34.73 feet to a point easterly of the main mill entrance; Thence S 36° 00' 39" E, running easterly of said entrance, a distance of 319.50 feet to a point; Thence N 51° 31' 13" E, a distance of 157.57 feet to a point;

Thence N 33° 43' 40" E, a distance of 156.22 feet to a point on said Bangor and Aroostook Railroad right of way;

Thence N 82° 09' 54" W by and along said right of way, a distance of 373.33 feet to the point of beginning. The above described parcel contains 1.304 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

3.13.4.5 Easement Exception Area "E" (Bark Pile)

East Millinocket Mill

A certain lot or parcel of land being a portion of the East Millinocket mill site in the Town of East Millinocket, County of Penobscot, State of Maine and being more particularly described as follows:

Beginning at a point on the southerly side of a road leading from said mill to the Dolby Dam, so called, said point having coordinates N: 714,810.51 feet and E: 961,249.41 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence S 71° 45' 14" E, southerly of said road, a distance of 609.87 feet to a point; Thence S 74° 47' 02" E, southerly of said road, a distance of 492.66 feet to a point; Thence S 88° 24' 01" E, southerly of said road, a distance of 566.64 feet to a point; Thence S 63° 33' 30" E, southerly of said road, a distance of 331.46 feet to a point; Thence S 29° 51' 22" E, a distance of 73.64 feet to a point;

Thence S 19° 57' 30" W, a distance of 811.42 feet to a point; Thence S 10° 05' 41" E, a distance of 218.68 feet to a point; Thence S 42° 58' 36" E, a distance of 236.76 feet to a point;

Thence S 6° 55' 02" W, a distance of 181.02 feet to a point on the northerly shore of the West Branch of the Penobscot River; Thence in a general northwesterly direction, by and along said shoreline, a distance of 2640 feet, more or less, to a point on said shoreline, said point being located N 61° 19' 31" W, a distance of 2320.29 feet from the last described point; Thence N 13° 15' 42" E, a distance of 786.05 feet to the point of beginning.

Easement Exception Area "E" contains 48 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

3.13.4.6 Easement Exception Area "F" (Near Dolby Dam)

East Millinocket Mill

A certain lot or parcel of land being a portion of the East Millinocket mill site in the Town of East Millinocket, County of Penobscot, State of Maine and being more particularly described as follows: Beginning at an iron rod found on the southerly right of way line of the Bangor and Aroostook Railroad leading from said mill past the Dolby Dam, so called, said point having coordinates N: 717,165.86 feet and E: 957,447.58 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence S 30° 00' 26" W, a distance of 224.00 feet to a point;

Thence S 52° 02' 22" E, running northerly of a road leading from the Mill Site to Dolby Dam, a distance of 253.28 feet to a point; Thence S 33° 39' 28" E, running northerly of said road, a distance of 472.18 feet to a point;

Thence S 60° 15' 46" E, running northerly of said road, a distance of 1352.67 feet to a point;

Thence N 87° 54' 29" E, running northerly of said road, a distance of 426.47 feet to a point westerly of a spur line from said Bangor and Aroostook Railroad;

Thence N 71° 58' 57" E, running westerly of said spur line, a distance of 557.25 feet to a point;

Thence N 4° 16' 32" E, a distance of 102.45 feet to a point on the southerly right of way line of said Bangor and Aroostook Railroad;

Thence N 66° 43' 54" W by and along said right of way, a distance of 952.98 feet to a point of curvature;

Thence by and along said right of way on a tangent curve to the left with a radius of 1860.58 feet, an arc distance of 214.42 feet to a point of tangency;

Thence N 73° 20' 09" W by and along said right of way, a distance of 565.94 feet to a point of curvature;

Thence by and along said right of way on a tangent curve to the right with a radius of 1959.58 feet, an arc distance of 549.96 feet to a point of compound curvature;

Thence by and along said right of way on a curve to the right with a radius of 2914.43 feet, an arc distance of 466.57 feet to the point of beginning. Easement Exception Area "F" contains 27.850 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

3.13.5 Dolby Pond Shoreline and Partridge Brook Flowage East Millinocket

A Hydroelectric Easement, located upon, over, under, through and across the following described parcels in Paragraphs 3.13.5.1 through 3.13.5.4:

3.13.5.1 FERC Boundary Southeasterly Strip, Partridge Cove

East Millinocket, Maine

A certain lot or parcel of land being a 200 feet wide strip of land situated on the southerly side of the Partridge Cove flowage, so called, in the Town of East Millinocket, County of Penobscot, State of Maine and being more particularly described as follows: Beginning at a point on the easterly side of said Partridge Cove Flowage having coordinates N: 724,948.19 feet and E: 957,902.08 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence N 46° 02' 22" W, a distance of 222 feet, more or less, to a point on the southerly shore of the said Partridge Cove flowage, said point is further described as being located at contour elevation 336.2 feet;

Thence running in a southwesterly direction by and along the southwesterly shore of said Partridge Cove flowage as defined by contour elevation 336.2 feet, a distance of 2160 feet, more or less, to a point defined by the intersection of said contour elevation

336.2 with the northeasterly right of way line of State Route 157 as depicted on Maine State Highway Commission Right of Way Map for State Highway 315, S.H.C. File No. 10-98, Sheet 4 of 9, dated

November 1954 and recorded in Plan Book 22, Page 57 of the Penobscot County Registry of Deeds;

Thence in a southeasterly direction, by and along said State Route 157 right of way, a distance of 200 feet, more or less, to a point defined by the intersection of said right of way line with the line offset 200 feet from said contour elevation 336.2 feet;

Thence in a general easterly and northeasterly direction, at all times 200 feet southeasterly and easterly of said contour elevation

336.2 feet, a distance of 1750 feet, more or less, to the point of beginning.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

3.13.5.2 FERC Boundary Northerly Strip, Partridge Cove East Millinocket, Maine

A certain lot or parcel of land being a 200 feet wide strip of land situated on the northeasterly and northerly and westerly side of the Partridge Cove flowage, so called, in the Town of East Millinocket, County of Penobscot, State of Maine and being more particularly described as follows:

Beginning at a point on the easterly side of said Partridge Cove Flowage having coordinates N: 725,788.08 feet and E: 958,250.41 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD83):

Thence N 77° 11' 55" W, a distance of 205 feet, more or less, to a point on the easterly shore or the said Partridge Cove flowage, said point is further described as being located at contour elevation 336.2 feet;

Thence running in a northeasterly direction, northwesterly direction, westerly direction, southeasterly direction and southwesterly direction by and along the easterly, northerly and westerly shore of said Partridge Cove flowage as defined by contour elevation

336.2 feet to the northeasterly right of way line of State Route 157 as depicted on Maine State Highway Commission Right of Way Map for State Highway 315, S.H.C. File No. 10-98, Sheet 4 of 9, dated November 1954 and recorded in Plan Book 22, Page 57 of the Penobscot County Registry of Deeds;

Thence in a northwesterly direction, by and along said right of way line a distance of 200 feet, more or less, to a point defined by the intersection of said right of way line with the line offset 200 feet from said contour elevation 336.2 feet;

Thence in a general northerly direction, northeasterly direction, easterly direction, southeasterly direction and southerly direction, at all times 200 feet from said contour elevation 336.2 feet, to the point of beginning.

3.13.5.3 FERC Boundary Northeasterly Strip, Dolby Pond East Millinocket, Maine

A certain lot or parcel of land being a strip of land of varying width situated on the northeasterly and easterly side of Dolby Pond, so called, in the Town of East Millinocket, County of Penobscot, State of Maine and being more particularly described as follows: Beginning at a point defined by the intersection of the northwesterly right of way line of the Bangor and Aroostook Railroad, as depicted on the Bangor & Aroostook Railroad Company Right of Way and Track Map, Schoodic Stream Junction to East Millinocket, sheets V.2.h/1 and V.2.h/2, dated June 30, 1916, with the easterly shore of said Dolby Pond, further described as being located at contour elevation 336.2 feet, said point having

coordinates N: 720,379.5 feet, E: 956,822.0 feet;

Thence running in a northerly and northwesterly direction by and along said Dolby Pond by and along said contour elevation 336.2 feet, a distance of 8460 feet, more or less, to a point defined by the intersection of said contour line with the town line between the towns of East Millinocket and TA R7;

Thence running in a northerly direction by and along the easterly line of said TA R7, a distance of 333 feet, more or less, to a point defined by the intersection of said town line with the southwesterly right of way line of said Bangor & Aroostook Railroad;

Thence in a southeasterly direction, southerly direction and southwesterly direction, by and along said Bangor & Aroostook Railroad right of way, a distance of 6700 feet, more or less, to the point of beginning.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

3.13.5.4 Islands in Dolby Pond Millinocket and East Millinocket

TOGETHER WITH all islands within the portion of Dolby Pond situated in Millinocket and East Millinocket.

3.14 Dolby and East Millinocket - Mill Dam (New Substation)

3.14.1 Mill Dam Parcel

Township A, Range 7, Dolby Dam, East Millinocket

A certain lot or parcel of land with buildings and improvements thereon, including, without limitation, the dam and dam structures situated in the Town of East Millinocket and Township A, Range 7, WELS, County of Penobscot, State of Maine and being more particularly described as follows:

Beginning at a ¾ inch rebar set by Plisga & Day, Land Surveyors in 1991 along the southwesterly sideline of a Bangor & Aroostook Railroad right of way, said rebar marking the northwesterly corner of the second parcel of land described in a quit claim deed from Great Northern Nekoosa Corporation to Great Northern Paper Company, dated December 19, 1991 and recorded in Book 4966, Page 114 of the Penobscot County Registry of Deeds;

Thence S 30° 00' 26" W, a distance of 299.00 feet to a point; Thence S 59° 59' 34" E, a distance of 121.00 feet to a point;

Thence S 30° 00' 26" W crossing the West Branch of the Penobscot River a distance of 669.51 feet to a point at or near the intersection of this line with the southwesterly normal water line of the said river, said point having coordinates of N: 716,266.66 feet, E: 957,068.00 feet of the Maine State Plane Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence in a generally southeasterly and easterly direction by and along the normal water line of the said river and impoundment, a distance of 9200 feet, more or less, to a point at or near the intersection of said normal water line with the boundary line of the parcel described herein which crosses to the thread of said river northwesterly of the East Millinocket dam, said point having coordinates of N: 712,165.68 feet, E: 964,616.15 feet;

Thence N 27° 16' 50" E, a distance of 314 feet, more or less, to the thread of said river, also being the town line between East Millinocket and TA R7, WELS;

Thence in a general easterly direction, by and along the thread of said river, crossing said East Millinocket Dam, a distance of 1025 feet, more or less, to a point;

Thence S 17° 18' 05" W, a distance of 248 feet, more or less, to a point having coordinates: N: 711,830.46 feet E: 965,635.48 feet;

Thence S 70° 31' 14" W, a distance of 118.00 feet to a point;

Thence S 28° 36' 10" W crossing a line of steel structures supporting an electric power line coming from the Weldon Dam, so called, a distance of 349.23 feet to a point being 85 feet southwesterly and normal to the centerline of said power line structures; Thence N 84° 38' 20" W, a distance of 10.82 feet to a point 100 feet southerly and normal to an angle point in said power line; Thence continuing along the same course, 100 feet southerly of, and parallel to, the said power line, a distance of 1433.21 feet to a point;

Thence S 23° 32' 21" W, a distance of 68.41 feet to a point 165 feet southerly and normal to said power line;

Thence N 84° 38' 20" W parallel to and 165 feet southerly of the said power line, a distance of 1435.54 feet to a point; Thence N 51° 44' 55" W parallel to and 165 feet southerly of the said power line, a distance of 4966.06 feet to a point; Thence N 55° 50' 01" W parallel to and 165 feet southerly of the said power line, a distance of 1457.65 feet to a point; Thence N 60° 00' 03" W parallel to and 165 feet southerly of the said power line, a distance of 642.70 feet to a point;

Thence N 85° 13' 45" W parallel to and 165 feet southerly of the said power line, a distance of 1911 feet, more or less, to a point which is defined by the intersection of this line and a property boundary line;

Thence N 5° 09' E, more or less, by and along said boundary line, a distance of 890 feet, more or less, to the southerly normal water line of the Dolby Dam impoundment;

Thence in a generally easterly direction, by and along the normal water line of the said impoundment, a distance of 2400 feet, more or less, to a point at or near the intersection of said normal water line with the boundary line of the parcel described herein which crosses the impoundment northwesterly of the said Dolby Dam, said point having coordinates of N: 716,271.05 feet, E: 956,558.61 feet;

Thence N 29° 45' 13" E crossing the said impoundment, a distance of 1162.34 feet to a point at or near the intersection of this line with the northerly normal water line of the said impoundment, said point having coordinates of N: 717,280.16 feet, E: 957,135.45 feet;

Thence N 36° 14' 20" E, a distance of 142.08 feet to a point along the southwesterly sideline of the said Bangor & Aroostook Railroad right of way;

Thence in a southeasterly direction, by and along a curve of the said railroad right of way, with concavity to the northeast, a radius of 2914.43 feet and an arc distance of 323.34 feet to the point of beginning, said curve having a chord bearing S 44° 54' 18" E, a chord distance of 232.17 feet.

SUBJECT to a portion of an 80 foot wide transmission line granted by Great Northern Nekoosa Corporation to the Bangor Hydro- Electric Company, dated April 26, 1979 and recorded at the Penobscot Registry of Deeds in Volume 2974, Page 238 and identified therein as "STRIP D."

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet, E: 977,164.59 feet which are based on the 1992 readjustment.

TOGETHER WITH all islands within said East Millinocket impoundment lying within the Town of East Millinocket.

3.14.2 New Substation

Township A, Range 7

A certain lot or parcel of land situated southerly of the Penobscot River and southerly of the dam across the Penobscot River at Great Northern Paper Company at the East Millinocket Mill Site, said parcel is located in Township A, Range 7, County of Penobscot, State of Maine and being more particularly described as follows:

Beginning at a point on the southerly line of the East Millinocket Dam Parcel, so called, said point is also described as being located S 85° 39' 12" W, more or less, a distance of 593 feet, more or less, from the center of a steel transmission tower designated as No. 55, said point of beginning is further described as being located at coordinates N: 711,540.13 feet, E: 964,764.29 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence N 84° 38' 20" W by and along the southerly line of the East Millinocket Dam Parcel, a distance of 848.67 feet to an angle point in the southerly line of said parcel;

Thence S 23° 32' 21" W by and along the southerly line of the East Millinocket Dam Parcel, a distance of 68.41 feet to an angle point in the southerly line of said parcel;

Thence N 84° 38' 20" W by and along the southerly line of the East Millinocket Dam Parcel, a distance 190.03 feet to a point on said line;

Thence S 21° 12' 49" W, a distance of 437.74 feet to the southwesterly corner of the parcel herein described, said point is further described as being on the southerly line of an 80 foot wide Bangor Hydro-Electric Company easement described as Strip D in a deed of easement recorded at the Penobscot Registry of Deeds in Volume 2974, Page 238;

Thence S 85° 07' 38" E by and along the southerly line of said Bangor Hydro-Electric Company, a distance of 1044.15 feet to a point on said line;

Thence N 21° 12' 49" E, a distance of 496.06 feet to the point of beginning.

SUBJECT to prior easement rights of Bangor Hydro-Electric Company as described in deeds recorded at the Penobscot Registry of Deeds in Volume 2974, Page 238.

3.15 Mattaceunk Dam Parcel (New Substation Easement) Mattawamkeag, Maine and Woodville, Maine

3.15.1 Mattaceunk Dam Parcel

A certain lot or parcel of land with buildings and improvements thereon, situated on the westerly side of Route #157 in the Town of Mattawamkeag and the Town of Woodville, County of Penobscot, State of Maine and being more particularly described as follows: Beginning at a concrete highway monument found on the southwesterly sideline of Route #157 in the Town of Mattawamkeag at

P.C. Station 880+32.16 as shown on the Maine State Highway Commission Right of Way Map for State Highway "315", S.H.C. File No. 10-140, sheet 1 of 4, dated January 1962, said concrete monument having coordinates of N: 694,225.42 feet, E: 1,008,190.00 feet of the Maine State Plane Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence in a general southeasterly direction, by and along the southwesterly sideline of said Route #157, along a curve to the right with a radius of 2814.62 feet, an arc distance of 968.53 feet and a

chord with a bearing of S 42° 09' 50" E and length of 963.76 feet to a point of tangency;

Thence S 32° 18' 21" E by and along the southwesterly sideline of said Route 157, a distance of 888.82 feet to a point of curvature; Thence along a curve to the left with a radius of 3869.40 feet, an arc distance of 405.89 feet to a point defined by the intersection of the southwesterly sideline of said Route #157 with the projection of a fence line from the northeasterly side of said Route #157; Thence S 75° 41' 53" W by and along the projection of said fence line, a distance of 66 feet, more or less, to the normal water line of the West Branch of the Penobscot River;

Thence in a general northwesterly direction, by and along said normal water line, a distance of 693 feet, more or less, to a point defined by the intersection of said normal water line with the boundary line of the parcel described herein which crosses said Penobscot River southeasterly of the Mattaceunk Dam, said point having coordinates of N: 693,003.05 feet, E: 1,009,122.94 feet, said coordinates are intended to identify the location and direction of the boundary line and may not be at the physical intersection as defined;

Thence S 57° 41' 39" W, a distance of 409.02 feet to a point;

Thence S 82° 24' 02" W, crossing into the Town of Woodville, a distance of 608.04 feet to a point located 108 feet, more or less, westerly of the normal water line on the southwesterly side of said Penobscot River having coordinates of N: 692,704.04, E: 1,008,174.54;

Thence N 30° 50' 29" W, a distance of 609.83 feet to a point; Thence N 47° 29' 11" W, a distance of 418.78 feet to a point; Thence S 38° 40' 52" W, a distance of 469.82 feet to a point; Thence N 51° 27' 47" W, a distance of 625.98 feet to a point; Thence N 47° 32' 26" W, a distance of 187.67 feet to a point;

Thence N 37° 39' 46" W, a distance of 168.76 feet to a point on the southwesterly line of a transmission line right of way;

Thence N 11° 44' 12" E, normal to said right of way line, a distance of 60.00 feet to the centerline of said right of way having coordinates N: 693,852.91 feet, E: 1,006,540.57 feet, said point being located S 11° 44' 12" W, a distance of 22.6 feet, more or less, from the center of Tower #2 of said transmission line;

Thence continuing N 11° 44' 12" E, a distance of 60.00 feet to a point on the northeasterly side of said right of way;

Thence N 22° 01' 50" E, a distance of 93.00 feet to a point at or near the normal water line of said Penobscot River, said point having coordinates of N: 693,997.86 feet and E: 1,006,587.66 feet;

Thence N 35° 23' 15" E, a distance of 1037.64 feet crossing back into the Town of Mattawamkeag to a point defined by the intersection of the line herein described with the town line between Mattawamkeag and Molunkus, said point is further described as being at or near normal water line on the northeasterly side of said Penobscot River, said point having coordinates N: 694,843.81 feet, E: 1,007,188.57 feet; Thence N 76° 25' 20" E by and along said town line, a distance of 164.46 feet to a point on the southwesterly sideline of said Route #157;

Thence S 52° 01' 18" E by and along said Route #157, a distance of 1067.65 feet to the point of beginning.

Subject to an easement granted by the Great Northern Paper Co. to the Bangor Hydro-Electric Company over a 225 foot wide strip of land for a transmission line right of way, said easement is dated April 18, 1968 and recorded at the Penobscot Registry of Deeds in Volume 2129, Page 468.

The above described parcel contains 66 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey

of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet, E: 977,164.59 feet which are based on the 1992 readjustment.

The position of the Mattawamkeag/Molunkus town line referenced herein is based on the location of a blazed line crossing Route #157.

3.15.2 New Substation Easement - intentionally omitted

NOTE: GLHA released all its rights in 3.15.2 to MTC in the Easement Agreement, Release of Option and Confirmatory Release Deed dated January 2, 2003 and recorded in said Registry of Deeds in Book 8532, Page 256.

3.16 Rice Farm Road (Dead Man's Corner) Boat Launch

A certain lot or parcel of land encompassing a boat launch facility and related parking and access roads and drives situated in the Town of Millinocket, County of Penobscot, State of Maine, being generally located on the southwesterly side of the Rice Farm Road, so called, being more specifically bounded and described as follows:

Beginning at a point on the southwesterly side of said Rice Farm Road at a distance of 33 feet, more or less, normal to said road centerline and at State Plane Coordinates, N 719416.26 feet, E 943750.55 feet as referenced to the Maine State Plane Coordinate System, Maine, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD83);

Thence by and along the southwesterly sideline of said Rice Farm Road, S 31° 14' 32" E, a distance of 66.83 feet to a point of curvature;

Thence by and along said road sideline following a curve that is concave to the northeast, having a radius of 311.50 feet, and an arc length of 121.66 feet, to a point;

Thence, S 01°59'24" E, a distance of 95 feet, more or less, to the high water mark of the Penobscot River;

Thence in a generally westerly direction by and along said high water line, a distance of 110 feet, more or less, to a point defined by the intersection of the said high water line with the next course described herein;

Thence N 38° 57' 37" W, a distance of 193 feet, more or less, to an angle point;

Thence N 50° 55' 38" E a distance of 137.82 feet to the point of beginning. The above described parcel contains 0.79 acres, more or less.

Also granting an easement for the use, repair, maintenance, and improvement of any portion of the boat launch facilities that may fall below the present (2001) high water line of said Penobscot River.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet, E: 977,164.59 feet which are based on the 1992 readjustment.

3.17 Dolby Boat Launch

A certain lot or parcel of land encompassing a boat launch facility and related parking and access roads and drives situated in the Town of Millinocket, County of Penobscot, State of Maine, being

generally located on the southwesterly side of Dolby Pond, so called, northeasterly of State Routes 11 and 157, and generally northeasterly of the intersection of said Routes 11 & 157 with the Bangor & Aroostook Railroad, so called, being more particularly bounded and described as follows:

Beginning at the intersection of the northeasterly sideline of said Routes 11 & 157 as shown on a plan entitled: "State Highway Commission Right of Way Map, State Highway "315", S.H.C. File No. 10-98", Dated November 1954, with the northeasterly sideline of the Bangor & Aroostook Railroad as defined on a plan entitled; "Right of way and Track Map, Schoodic Stream Junction to East Millinocket", dated June 30, 1916, said point of intersection also being at Maine State Plane Coordinates N 728515.63 feet, E 951691.11 feet, referenced to the Maine State Coordinate System East Zone, said coordinate system is based on the North American Datum of 1983 (NAD83);

Thence by and along said line of the Bangor and Aroostook Railroad following a curve that is concave to the northeast, having a radius of 905.43 feet, for an arc distance of 175.09 feet, said arc also having a chord bearing of N 25° 18' 18" W and a distance of

174.81 feet, to an angle point;

Thence N 50° 29' 26" E, a distance of 54 feet, more or less, to the high water line of said Dolby Pond;

Thence by and along said high water line in a generally southeasterly direction a distance of 375 feet, more or less, to the intersection of said water line with said northeasterly line of said Routes 11 & 157;

Thence by and along said line of Routes 11. & 157, following a curve that is concave to the southwest, with a radius of 1323.57 feet, and a chord bearing of N 59° 41' 41" W and a distance of 178 feet, more or less, an arc distance of 178 feet, more or less, to the point of beginning.

Also granting an easement for the use, repair, maintenance, and improvement of any portion of the boat launch facilities that may fall below the high water line of said Dolby Pond.

The above described parcel of land encompasses 0.71 acres, more or less.

**4. PENOBSCOT AND PISCATAQUIS COUNTY**

Transmission Line Easements

Transmission line easements, located upon, over, under, through and across the transmission line easement parcels described in Paragraphs 4.1 to 4.9 in Penobscot and Piscataquis Counties (hereinafter, "Transmission Line Easements"), for the following purposes:

Easements to construct (including new utility lines), maintain, operate and upgrade from time to time for electrical transmission, one or more lines consisting of overhanging and/or underground wires (including, without limitation, high voltage electric transmission wires and appurtenances), pipes, cables or facilities with necessary or convenient poles, stanchions, fixtures and supports, with the right to transmit electricity and intelligence over and through said lines, and to clear and dispose of interfering branches and other growth from time to time, with permission to enter upon the said lands for the above purposes (whether or not on existing roads now serving, connecting to or traversing said lines).

Also the right to build roads as may be reasonably required to exercise said easement rights, excavate, clear and trim trees, shrubs and other growth within the easement limits as necessary or convenient to accomplish any work related to the within-granted easements, provided that all such work shall be in accordance with all applicable licenses, laws, codes, ordinances and other governmental requirements, and performed in a good and workmanlike manner.

SUBJECT TO the following conditions:

(1) Use of the easements shall be at the sole risk of the easement user; and

(2) The easement user shall obtain and maintain in full force and effect all governmental approvals and financial responsibility requirements required by all applicable laws for construction and use of the easements.

4.1 Transmission Line Easement Mattaceunk Dam to East Millinocket Woodville, Medway and TA R7 WELS

The following is a description of a 120 foot wide right of way for a Transmission Line Easement and for utility services as defined in Title 33 M.R.S.A. §458, excluding gas, diesel, natural gas, fuel and any other petroleum products, but including the right to transmit utilities, energy, electricity and intelligence, which said transmission line easement is 60 feet either side of the following described centerline, and said transmission line easement is located in the Towns of Woodville, Medway and TA R7 WELS in the County of Penobscot, State of Maine and is more particularly described as follows:

Beginning at a point on the centerline of the said transmission line, said point further described as being located at coordinates of N: 693,852.91 feet, E: 1,006,540.57 feet of the Maine State Plane Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83); Thence N 78° 15' 48" W along the centerline of the herein described easement, as said centerline crosses from the Town of Woodville into the Town of Medway, a distance of 8164.08 feet to an angle point in said centerline;

Thence N 78° 00' 34" W along the centerline of the herein described easement, as said centerline crossing State Route 116, a distance of 5334.31 feet to an angle point in said centerline;

Thence N 36° 47' 29" W along the centerline of the herein described easement, as said centerline crossing Pattagumpus Stream, a distance of 1160.15 feet to an angle point in said centerline; Thence N 66° 06' 19" W along the centerline of the herein described easement, as said centerline crossing State Route 116, State Route 116 a second time and Interstate 95, a distance of 20695.51 feet to an angle point in said centerline;

Thence N 47° 03' 31" W along the centerline of the herein described easement, as said centerline crossing Powersville Road, a distance of 2189.30 feet to an angle point in said centerline;

Thence N 58° 33' 11" W along the centerline of the herein described easement, as said centerline crossing from the Town of Medway into TA R7 WELS, a distance of 7881.89 feet to the terminus of said easement, said terminus is located at coordinates of N: 711,537.24 feet, E: 965,385.81 feet, as reference to the aforementioned coordinate system;

ALSO the following transmission line easements over, under or through land of others as follows:

a. Deed of Ralph C. Twist to Great Northern Paper Company dated May 28, 1938 and recorded in Book 1131, Page 238;

b. Deed of Henry Day to Great Northern Paper Company dated April 23, 1938 and recorded in Book 1131, Page 112;

c. Deed of Robert F. Reardon, Sr. to Great Northern Paper Company dated June 4, 1938 and recorded in Book 1133, Page 303;

d. Deed of Hughie E. York and Roscoe L. York to Great Northern Paper Company dated August 18, 1938 and recorded in Book 1134, Page 125;

e. Deed of Cathy L. Small to GNP dated May 22, 1998 and recorded in Book 6728, Page 165;

f. Deed of Eugene Smith to GNP dated February 24, 1998 and recorded in Book 6728, Page 166;

g. Deed of George Merritt to GNP dated February 24, 1998 and recorded in Book 6728, Page 167;

h. Deed of John A. Oxley to GNP dated February 28, 1998 and recorded in Book 6728, Page 168;

i. Deed of Michael Kimball to GNP dated March 6, 1998 and recorded in Book 6728, Page 169;

j. Deed of Andrew York to GNP dated February 27, 1998 and recorded in Book 6728, Page 170; and

k. Deed of Lee Jay McLaughlin to GNP dated March 18, 1999 and recorded in Book 6997, Page 99.

Subject to any easement rights that may have been granted to the Bangor Hydro-Electric Company for a transmission line that runs parallel and southwesterly of a portion of the line herein described and for transmission lines that cross the line herein described.

Subject to the rights of the public for the State and Federal highways that cross the easement line described herein.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet, E: 977,164.59 feet which are based on the 1992 readjustment.

4.2 Transmission Line Easement

Crossing Webber Timberland TA R7 WELS

GLHA acknowledges that Katahdin Forest Management LLC has no interest in the following parcels described below in sections 4.2.1 and 4.2.2.

4.2.1 First Easement Parcel

A certain parcel or strip of land for a Transmission Line Easement and, to the fullest extent allowed under the rights of KPC and KT for utility services as defined in Title 33 M.R.S.A. §458 including the right to transmit utilities, fuel, energy, electricity and intelligence, more particularly described as follows: Beginning at an iron pin on the township line between Township A, Range 7,

W.E.L.S. and Indian Purchase Township Number 3, said pin being 100 feet, more or less, northerly along said township line from the northern most electric power transmission line and being the point of beginning;

thence, North 77° 02' E, 1,431 feet, more or less, along the northerly boundary of a two hundred sixty-five foot (265') wide right of way, to a point;

thence, North 83° 02' East, 3,294 feet, more or less, along the northerly boundary of a two hundred sixty-five foot (265') wide right of way, to a point;

thence, South 86° 03' East, 9,507 feet, more or less, along the northerly boundary of a two hundred sixty-five foot (265') wide right of way, to a point on the center line of Township A, Range 7, W.E.L.S.; thence, South 08° 08' West, 265 feet, more or less, along the center line of Township A, Range 7, W.E.L.S., to a point located at the intersection of the center line and the southerly boundary of a two hundred sixty-five foot (265') wide right of way;

thence, North 86° 03' West, 9,552 feet, more or less, along the southerly boundary of a two hundred sixty-five foot (265') wide right of way, to a point;

thence, South 83° 02' West, 3,204 feet, more or less, along the southerly boundary of a two hundred

sixty-five foot (265') wide right of way, to a point;

thence, South 77° 02' West, 1,418 feet, more or less, along the southerly boundary of a two hundred sixty-five foot (265') wide right of way, to a point on the township line between Township A, Range 7, W.E.L.S. and Indian Township Number 3;

thence, North along said township line, 265 feet, more or less, to the point of beginning. The Utility Easement Strip contains 86.58 acres, more or less.

Bearings refer to the Maine Coordinate System, East Zone (Transverse Mercator), 1000-Meter Universal Transverse Mercator Grid.

The above-described First Easement Parcel is also described as follows:

A certain lot or parcel of land being a 265 foot wide strip of land for an electrical transmission line easement situated in TA R7 WELS in the county of Penobscot State of Maine, said easement area is more particularly described as follows:

Beginning at a #6 rebar with an aluminum cap stamped "PLS 1030" set in the town line between T3 Indian Purchase and TA R7 WELS, said iron rod is further described as being located N 74° 41' 53" E, a distance of 2.89 feet, more or less, from the most northerly pole of a three pole structure numbered 81 on the Bangor Hydro-Electric Company transmission line, said point of beginning is further identified as being located at coordinates of N: 716,033.96 feet, E: 940,830.17 feet of the Maine State Plane Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence N 11° 43' W, more or less, by and along said town line, a distance of 422.77 feet to a point defined by the intersection of said town line with the northerly line of the easement described herein;

Thence S 50° 31' 51" E, a distance of 200.39 feet to an angle point located northerly of steel transmission tower D23; Thence N 77° 33' 04" E, a distance of 1131.08 feet to an angle point located northerly of steel transmission tower D21; Thence N 82° 08' 10" E, a distance of 3235.00 feet to an angle point located northerly of steel transmission tower D17; Thence S 86° 06' 19" E, a distance of 5226.85 feet to an angle point located northerly of said steel transmission tower D10; Thence S 86° 02' 08" E, a distance of 3649.04 feet to an angle point located northerly of steel transmission tower D5;

Thence S 85° 13' 45" E, a distance of 859.5 feet, more or less, to a point defined by the intersection of the line herein described and the westerly line of land now or formerly of Great Northern Paper, Inc.;

Thence southerly by and along land of said Great Northern Paper, Inc., a distance of 265 feet, more or less, to a point on the southerly line of the easement herein described, said point is further described as being 265.00 feet southerly as measured on a line that is perpendicular to the last course herein described;

Thence N 85° 13' 45" W, a distance of 855.8 feet, more or less, to an angle point located southerly of steel transmission tower D5; Thence N 86° 02' 08" W, a distance of 3647.02 feet, more or less, to an angle point located southerly of steel transmission tower D10;

Thence N 86° 06' 19" W, a distance of 5199.40 feet, more or less, to an angle point located southerly of steel transmission tower D17;

Thence S 82° 08' 10" W, a distance of 3197.10 feet, more or less, to an angle point located southerly of steel transmission tower D21;

Thence S 77° 33' 04" W, a distance of 1249 feet, more or less, to a point on said town line between TA R7 WELS and T3 Indian Purchase and the point of beginning.

SUBJECT in part to an easement granted to the Bangor Hydro-Electric Company by the Webber Heirs, said easement is described in a deed recorded at the Penobscot Registry of Deeds in Volume

2161, Page 364.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet, E: 977,164.59 feet which are based on the 1992 readjustment.

4.2.2 Second Easement Parcel

A certain lot or parcel of land being a 200 foot wide strip of land for a Transmission Line Easement and, to the fullest extent allowed under the rights of KPC and KT for utility services as defined in Title 33 M.R.S.A. §458 including the right to transmit utilities, fuel, energy, electricity and intelligence, situated in TA R7 WELS in the county of Penobscot State of Maine, said easement area is more particularly described as follows:

Beginning at a point on the town line between Indian Purchase No. 3 and TA R7 WELS, said point is further described as being located S 11° 43' E, more or less, as measured along said town line a distance of 40 feet, more or less, from the center of an 80 foot wide Bangor Hydro-Electric Co. easement described in a deed from the Webber heirs and recorded at the Penobscot Registry of Deeds in Volume 2161, Page 364, said point of beginning is further identified as being located at coordinates of N: 715,990.26 feet, E: 940,839.23 feet of the Maine State Plane Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence N 77° 30' 30" E by and along the southerly line of said Bangor Hydro-Electric Company easement, a distance of 1267 feet, more or less, to an angle point in said easement;

Thence N 82° 12' 45" E by and along the southerly line of said Bangor Hydro-Electric Company easement, a distance of 3138.2 feet to an angle point in said easement;

Thence S 86° 09' 30" E by and along the southerly line of said Bangor Hydro-Electric Company easement, a distance of 5227.6 feet to an angle point in said easement;

Thence S 86° 05' 20" E by and along the southerly line of said Bangor Hydro-Electric Company easement, a distance of 3647.3 feet to an angle point in said easement;

Thence S 85° 13' 50" E by and along the southerly line of said Bangor Hydro-Electric Company easement, a distance of 855 feet, more or less, a point defined by the intersection of the line herein described with the westerly line of land now or formerly of Great Northern Paper Co.;

Thence S 5° 09' W, more or less, by and along land of said Great Northern Paper Co., a distance of 200 feet, more or less, to a point on the southerly line of the easement herein described, said point is further described as being 200.00 feet southerly as measured on a line that is perpendicular to the last course herein described;

Thence N 85° 13' 50" W, a distance of 852 feet, more or less, to an angle point in said easement; Thence N 86° 05' 20" W, a distance of 3645.7 feet to an angle point in said easement;

Thence N 86° 09' 30" W, a distance of 5207.2 feet to an angle point in said easement; Thence S 82° 12' 45" W, a distance of 3109.6 feet to an angle point in said easement;

Thence S 77° 30' 30" W, a distance of 1261 feet, more or less, to a point on said town line between TA R7 WELS and T3 Indian Purchase;

Thence N 11° 43' W, more or less, by and along the town line between TA R7 WELS and Indian Purchase No. 3, a distance of 200.02 feet, more or less, to the point of beginning.

Bearings referenced in the above description were computed from a traverse established for a survey

of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet, E: 977,164.59 feet which are based on the 1992 readjustment.

4.3 Transmission Line Easement

Township A, Range 7 Town Line to Millinocket Mill Township 3, Indian Purchase and Millinocket, Maine

A certain lot or parcel of land being a 265 foot wide strip of land for a Transmission Line Easement and for utility services as defined in Title 33 M.R.S.A. §458, excluding gas, diesel, natural gas, fuel and any other petroleum products, but including the right to transmit utilities, energy, electricity and intelligence, situated in Township 3, Indian Purchase and the Town of Millinocket in the county of Penobscot, State of Maine, said easement area is more particularly described as follows:

Beginning at a #6 rebar with an aluminum cap stamped "PLS 1030" set in the town line between T3 Indian Purchase and TA R7 WELS, said iron rod is further described as being located N 74° 41' 53" E, a distance of 2.89 feet, more or less, from the most northerly pole of a three pole structure numbered 81 on the Bangor Hydro-Electric Company transmission line, said point of beginning is further identified as being located at coordinates of N: 716,033.96 feet, E: 940,830.17 feet of the Maine State Plane Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence N 50° 31' 51" W, a distance of 746.77 feet to an angle point on an island in the West Branch of the Penobscot River; Thence N 54° 48' 17" W, crossing into the Town of Millinocket, a distance of 2,473.19 feet to a point on the easterly boundary of the Millinocket Mill Parcel;

Thence N 31° 52' 03" E by and along said Mill Parcel, a distance of 265.45 feet to a point, said point being located S 31° 52' 03" W, a distance of 9.21 feet from an iron rod at the easterly corner of said Mill Parcel;

Thence S 54° 48' 17" E, a distance of 2,498.49 feet to an angle point on an island in the West Branch of the Penobscot River; Thence S 50° 31' 51" E, crossing into Township 3, Indian Purchase, a distance of 427.25 feet to a point on the town line between Township 3, Indian Purchase, and TA R7 WELS;

Thence S 11° 43' E by and along said town line, a distance of 422.77 feet to the point of beginning.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet, E: 977,164.59 feet which are based on the 1992 readjustment.

Subject to any easement rights that may have been granted to the Bangor Hydro-Electric Company for a transmission line that runs parallel and southwesterly of the line herein described and for transmission lines that may cross the line herein described.

4.4 Transmission Line Easement Millinocket Mill - Millinocket, Maine

GLHA acknowledges that KT has no interest in the following parcels described below in sections 4.4.1 through 4.4.6 inclusive.

4.4.1 Transmission Line Easement Area 1 Millinocket Mill Site

A certain lot or parcel of land with buildings and improvements thereon situated in Millinocket, Penobscot County, Maine for a Transmission Line Easement and for the right to transmit intelligence and communications by wire or fiber, and natural gas, more particularly described as follows:

Beginning at a point that is along the southwesterly boundary of a transmission line easement area that runs from East Millinocket to Millinocket, so called, said transmission line is further described as being Easement Area 7 herein described, said point is also described as being northerly of a water clarifier of the mill treatment plant, said point of beginning is further described as being at coordinates N: 719,628.40 feet and E: 935,842.27, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence S 88° 13' 35" W, a distance of 2951.57 feet to a point; Thence N 1° 46' 25" W, a distance of 140.40 feet to a point; Thence N 74° 01 20" W, a distance of 540.56 feet to a point; Thence N 59° 32' 41" W, a distance of 1103.35 feet to a point;

Thence N 45° 48' 30" W, a distance of 338.76 feet to a point on a chain link fence said point being further described as a point on the Sub-Station No. 4 Parcel, said point has coordinates N: 720,621.56 feet and E: 931,174.08 feet according to aforementioned coordinate system;

Thence S 57° 48' 57" E by and along said chain link fence of said Sub-Station No. 4, a distance of 100.00 feet to a corner of said fence;

Thence N 31° 49' 10" E by and along said chain link fence of said Sub-Station No. 4, a distance of 215.04 feet to an angle point in said fence;

Thence continuing on the same bearing N 31° 49' 10" E, a distance of 93.87 feet to a point; Thence N 47° 44' 30" W, a distance of 130.00 feet to a point;

Thence N 34° 04' 08" W, a distance of 205.00 feet to a point;

Thence N 59° 05' 55" E, a distance of 28.72 feet to the most westerly corner of the Frequency Converter Parcel, so called, said point is further described as being the point of beginning of the Frequency Converter Parcel and is located at coordinates of N: 721,102.77 feet and E: 931,235.17 feet according to aforementioned coordinate system;

Thence S 38° 08' 00" E by and along the southwesterly line of the Frequency Converter Parcel, a distance of 155.00 feet to the most southerly corner of said Frequency Converter Parcel;

Thence N 51° 52' 00" E by and along the southeasterly line of the Frequency Converter Parcel, a distance of 102.00 feet to the most easterly corner of said Frequency Converter Parcel;

Thence S 77° 12' 23" E, a distance of 75.5 feet to the most westerly corner of Sub-Station No. 3-4, so called, said point is further described as being located at coordinates N: 721,027.11 and E: 931,484.74 according to aforementioned coordinate system; Thence S 38° 24' 42" E by and along the southwesterly line of said Sub-Station No. 3-4, a distance of 223.08 feet to the most southerly corner of said Sub-Station No. 3-4;

Thence N 51° 04' 29" E by and along the southeasterly line of said Sub-Station No. 3-4, a distance of 54.00 feet to the most easterly corner of said Sub-Station No. 3-4;

Thence N 39° 26' 20" W by and along the northeasterly line of said Sub-Station No. 3-4, a distance of 61.56 feet to a point on the northeasterly side of said Sub-Station No. 3-4;

Thence N 56° 17' 33" E, a distance of 58.79 feet to the most westerly corner of the T33 Transformer Parcel, said point is further described as being located at coordinates N: 720,966.41 and E: 931,675.15 according to aforementioned coordinate system; Thence S 36° 38' 49" E, a distance of 48.00 feet to the most southerly corner of said T33 Transformer Parcel;

Thence S 29° 36' 22" W, a distance of 117.45 feet to a point; Thence S 36° 33' 46" E, a distance of 435.66 feet to a point; Thence S 58° 06' 37" E, a distance of 583.83 feet to a point; Thence S 73° 17' 04" E, a distance of 672.16 feet to a point; Thence N 55° 19' 53" E, a distance of 627.08 feet to a point; Thence N 23° 46' 54" E, a distance of 485.69 feet to a point; Thence N 47° 45' 03" W, a distance of 564.10 feet to a point; Thence N 52° 50' 04" W, a distance of 839.28 feet to a point;

Thence N 40° 13' 08" W, a distance of 612.45 feet to a point on the southeasterly side of Sub-Station No. 1 (A.K.A. Little Italy Substation), so called;

Thence N 76° 24' 55" E by and along the southeasterly side of said Sub-Station No. 1, a distance of 52.78 feet to an angle point is the southeasterly line of said sub-station;

Thence N 51° 37' 37" E by and along the southeasterly side of said Sub-Station No. 1, a distance of 52.84 feet to a point a point on said line;

Thence S 40° 13' 08" E, a distance of 576.04 feet to a point; Thence S 52° 49' 16" E, a distance of 834.87 feet to a point; Thence S 47° 45' 03" E, a distance of 486.12 feet to a point;

Thence N 11° 36' 42" W, a distance of 279.96 feet to a point on the southwesterly side of the transmission line running from East Millinocket to Millinocket, said transmission line is further described as being Easement Area 7 herein described;

Thence S 71° 00' 43" E by and along the southwesterly line of said transmission line, a distance of 116.18 feet to a point on said line;

Thence S 11° 36' 42" E, a distance of 372.34 feet to a point; Thence S 24° 25' 54" W, a distance of 572.32 feet to a point; Thence S 48° 35' 46" W, a distance of 490.62 feet to a point;

Thence N 87° 41' 48" E, a distance of 2127.89 feet to a point on the southwesterly side of the transmission line running from East Millinocket to Millinocket, said transmission line is further described as being Easement Area 7 herein described;

Thence S 54° 50' 00" E by and along the southwesterly line of said transmission line, a distance of 468.59 feet to an angle point in said line;

Thence S 21° 07' 38" E by and along the southwesterly line of said transmission line, a distance of 125.00 feet to the point of beginning. Transmission Line Easement Area 1 contains 49.81 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

4.4.2 Transmission Line Easement Area 2 Millinocket Mill Site

A certain lot or parcel of land with buildings and improvements thereon situated in Millinocket, Penobscot County, Maine for a Transmission Line Easement and for the right to transmit intelligence and communications by wire or fiber, and natural gas, more particularly described as follows:

Beginning at a point on the southwesterly line of the Ferguson Canal Parcel, so called, which point is on the south easterly side of the road that runs southwesterly from the Millinocket Mill Site to Stone Dam, so called, said point of beginning is further described as being at coordinates N: 721,100.57 feet and E: 931,005.98 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence S 50° 32' 25" W by and along a line that lies on the southeasterly side of the road running to

said Stone Dam, said line is also the northwesterly line of the Sub-Station No. 4 Parcel, so called, a distance of 282.35 feet to the most westerly corner of said Sub-Station No. 4 Parcel;

Thence N 50° 35' 19" W, a distance of 11.03 feet to a corner of Transmission Line Easement Area 4, herein described;

Thence N 60° 46' 21" W, a distance of 303.09 feet to an angle point in said transmission line easement; Thence N 68° 41' 11" W, a distance of 418.80 feet to an angle point in said transmission line easement; Thence N 47° 28' 47" W, a distance of 234.58 feet, more or less, to a point defined by the intersection of said line with Ferguson Canal, so called;

Thence running in a northeasterly direction by and along the northwesterly line of said Ferguson Canal, a distance of 165 feet, more or less, to a point defined by the intersection of said northwesterly line of said Ferguson Canal with the southwesterly line of the said Ferguson Canal Parcel, said point is at or near coordinates N: 721,466.48 feet and E: 930,049.18 feet according to the aforementioned coordinate system, said point is further described as being N 50° 42' 12" E, a distance of 125.69 feet from the previously described point on the shore of said Ferguson Canal;

Thence S 32° 23' 58" E by and along the southwesterly line of said Ferguson Canal Parcel, a distance of 152.86 feet to an angle point in said lot;

Thence S 89° 03' 42" E by and along the southwesterly line of said Ferguson Canal Parcel, a distance of 72.77 feet to an angle point in said lot;

Thence S 73° 37' 40" E by and along the southwesterly line of said Ferguson Canal Parcel, a distance of 836.04 feet to the point of beginning. Transmission Line Easement Area 2 contains 3.66 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

4.4.3 Transmission Line Easement Area 3 Millinocket Mill Site

A certain lot or parcel of land with buildings and improvements thereon situated in Millinocket, Penobscot County, Maine for a Transmission Line Easement and for the right to transmit intelligence and communications by wire or fiber, and natural gas, more particularly described as follows:

Beginning at a point on the northeasterly line of the Ferguson Canal Parcel, so called, which point is westerly of the Head Gate House at the easterly end of said Ferguson Canal, said point of beginning is further described as being at coordinates N: 721,705.88 feet and E: 929,993.19 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence N 47° 38' 06" W, a distance of 490.23 feet to a point on the southwesterly side of the main mill entrance road;

Thence N 62° 23' 30" W, a distance of 71.78 feet to an angle point in said transmission line easement located on the southwesterly side of said main mill entrance road;

Thence N 55° 24' 35" W, a distance of 200.00 feet to an angle point in said transmission line easement located on the southwesterly side of said main mill entrance road;

Thence N 49° 51' 50" W, a distance of 936.01 feet to an angle point in said transmission line easement located on the southwesterly side of said main mill entrance road;

Thence N 53° 33' 55" W, a distance of 172.42 feet to an angle point in said transmission line easement located on the southwesterly side of said main mill entrance road;

Thence N 40° 38' 48" W, a distance of 349.61 feet to an angle point in said transmission line easement located on the southwesterly side of said main mill entrance road, said point is further described as being located near the Security Building at the main gate on said entrance road;

Thence N 46° 37' 12" W, a distance of 368.39 feet to a point defined by the intersection of said transmission line easement with the southerly sideline of State Route 11;

Thence running in a westerly direction by and along the southerly sideline of said State Route 11 following a 1465.52 foot radius curve to the right, an arc distance of 338.12 feet to a point on said sideline, said point is further described as being N 77° 39' 50" W, a distance of 337.37 feet from the previously described point on said curve;

Thence S 18° 56' 45" W, a distance of 48 feet, more or less, to the high water line on the shore of Ferguson Lake, so called; Thence running in a southeasterly direction by and along the high water line of the northeasterly shore of said Ferguson Lake a distance of 3055 feet, more or less, to a point defined by the intersection of said high water line with the northeasterly line of the Ferguson Canal Parcel, so called, said point is at or near coordinates N: 721,895.5 feet and E: 929,278.1 feet according to the aforementioned coordinate system, said point is further described as being S 45° 35' 23" E, a distance of 2198.23 feet from the previously described point on the shore of the said Ferguson Lake;

Thence S 87° 45' 22" E by and along the northeasterly line of the said Ferguson Canal Parcel, a distance of 138.71 feet to an angle point in said parcel;

Thence S 49° 48' 36" E by and along the northeasterly line of the said Ferguson Canal Parcel, a distance of 192.05 feet to an angle point in said parcel;

Thence S 31° 25' 20" E by and along the northeasterly line of the said Ferguson Canal Parcel, a distance of 107.53 feet to an angle point in said parcel;

Thence S 88° 44' 32" E by and along the northeasterly line of the said Ferguson Canal Parcel, a distance of 108.57 feet to an angle point in said parcel;

Thence S 72° 35' 48" E by and along the northeasterly line of the said Ferguson Canal Parcel, a distance of 63.75 feet to an angle point in said parcel;

Thence N 75° 27' 31" E by and along the northeasterly line of the said Ferguson Canal Parcel, a distance of 211.15 feet to the point of beginning. Transmission Line Easement Area 3 contains 10.5 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

4.4.4 Stone Dam Transmission Line Easement Easement Area 4

Millinocket Mill Site

A certain lot or parcel of land with buildings and improvements thereon situated in Millinocket, Penobscot County, Maine for a Transmission Line Easement, more particularly described as follows:

Beginning at a point that is southerly of Ferguson Canal, so called, and on the southeasterly side of the road leading to Stone Dam, so called, said point is located at coordinates N: 720,895.91 feet and

E: 930,818.67 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83); Thence S 49°13' 53" W, a distance of 42.79 feet to a point;

Thence S 49° 00' 52" W, a distance of 288.23 feet to a point; Thence S 56° 04' 37" W, a distance of 110.43 feet to a point; Thence S 18° 32' 03" W, a distance of 28.91 feet to a point; Thence S 48° 27' 21" W, a distance of 147.01 feet to a point; Thence S 44° 00' 30" W, a distance of 746.57 feet to a point; Thence S 62° 19' 46" W, a distance of 450.69 feet to a point; Thence S 53° 33' 03" W, a distance of 152.67 feet to a point; Thence S 41° 32' 21" W, a distance of 128.46 feet to a point; Thence S 24° 52' 06" W, a distance of 293.04 feet to a point;

Thence S 14° 25' 23" W, a distance of 309.69 feet to a point; Thence S 38° 08' 40" W, a distance of 319.14 feet to a point; Thence S 61° 10' 40 W, a distance of 153.45 feet to a point; Thence S 72° 25' 30" W, a distance of 538.46 feet to a point; Thence N 69° 39' 41" W, a distance of 160.69 feet to a point; Thence N 64° 32' 46" W, a distance of 742.30 feet to a point; Thence N 66° 39' 15" W, a distance of 111.46 feet to a point; Thence S 83° 18' 13" W, a distance of 184.31 feet to a point; Thence S 79° 01' 04" W, a distance of 255.40 feet to a point; Thence S 75° 33' 34" W, a distance of 164.63 feet to a point; Thence S 74° 52' 13" W, a distance of 122.92 feet to a point; Thence S 73° 03' 40" W, a distance of 147.72 feet to a point; Thence S 59° 34' 30" W, a distance of 33.97 feet to a point; Thence S 35° 57' 09" W, a distance of 47.90 feet to a point; Thence S 63° 57' 44" W, a distance of 68.74 feet to a point; Thence S 89° 04' 15" W, a distance of 104.50 feet to a point; Thence N 74° 20' 20" W, a distance of 64.29 feet to a point; Thence N 15° 39' 40" E, a distance of 50.00 feet to a point; Thence S 74° 20' 20" E, a distance of 57.00 feet to a point; Thence N 89° 04' 15" E, a distance of 86.08 feet to a point; Thence N 63° 57' 44" E, a distance of 45.14 feet to a point; Thence N 35° 57' 09" E, a distance of 45.88 feet to a point; Thence N 59° 34' 30" E, a distance of 50.34 feet to a point; Thence N 73° 03' 40" E, a distance of 154.42 feet to a point; Thence N 74° 52' 13" E, a distance of 124.01 feet to a point; Thence N 75° 33' 34" E, a distance of 166.44 feet to a point; Thence N 79° 01' 04" E, a distance of 256.91 feet to a point; Thence N 83° 15' 45" E, a distance of 201.39 feet to a point; Thence S 66° 39' 15" E, a distance of 126.79 feet to a point; Thence S 64° 32' 46" E, a distance of 740.06 feet to a point; Thence S 69° 39' 41" E, a distance of 141.28 feet to a point; Thence N 72° 25' 30" E, a distance of 516.54 feet to a point; Thence N 61° 10' 40" E, a distance of 138.34 feet to a point; Thence N 38° 08' 40" E, a distance of 298.46 feet to a point; Thence N 14° 25' 23" E, a distance of 303.76 feet to a point; Thence N 24° 52' 06" E, a distance of 304.94 feet to a point; Thence N 41° 32' 21" E, a distance of 141.05 feet to a point; Thence N 53° 33' 03" E, a distance of 161.77 feet to a point; Thence N 62° 19' 46" E, a distance of 446.46 feet to a point; Thence N 44° 00' 30" E, a distance of 740.45 feet to a point; Thence N 48° 27' 21" E, a distance of 135.59 feet to a point; Thence N 18° 32' 03" E, a distance of 32.54 feet to a point; Thence N 56° 04' 37" E, a distance of 124.34 feet to a point; Thence N 49° 00' 52" E, a distance of 285.24 feet to a point; Thence N 49° 13' 53" E, a distance of 34.23 feet to a point;

Thence S 50° 35' 19" E, a distance of 50.74 feet to the point of beginning.

EXCEPTING from the above described parcel any portion of the described easement that lies within the bounds of the Stone Dam Parcel so called.

Transmission Line Easement Area 4 contains 6.71 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

4.4.5 Transmission Line Easement Easement Area 6

Millinocket Mill Site

A certain lot or parcel of land with buildings and improvements thereon situated in Millinocket, Penobscot County, Maine for a Transmission Line Easement, more particularly described as follows:

Beginning at the most southerly corner of Sub-Station No. 1 (A.K.A. the Little Italy Sub-Station), said point of beginning is further described as being at coordinates N: 722,126.57 feet and E: 932,263.54 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence N 38° 37' 47" W by and along said chain link fence surrounding the aforementioned substation parcel, a distance of 94.87 feet to an angle point in said fence;

Thence N 51° 58' 15" E by and along said chain link fence a distance of 6.31 feet to the southwesterly side of a building;

Thence N 38° 35' 13" W by and along the southwesterly side of said building, a distance of 14.69 feet to the most westerly corner of said building;

Thence N 51° 17' 04" E by and along the northwesterly side of said building, a distance of 30.88 feet to the most northerly corner of said building;

Thence S 38° 35' 13" E by and along the northeasterly side of said building, a distance of 14.69 feet to a chain link fence; Thence N 50° 30' 28" E by and along said chain link fence, a distance of 8.02 feet to an angle point in said fence; Thence N 37° 17' 43" W by and along said chain link fence, a distance of 36.31 feet to an angle point in said fence; Thence N 02° 29' 16" W by and along said chain link fence, a distance of 17.23 feet to an angle point in said fence;

Thence N 39° 10' 19" W by and along said chain link fence, a distance of 81.47 feet to the southeasterly side of a building;

Thence S 50° 35' 09" W by and along the southeasterly side of said building 9.83 feet to the most southerly corner of said building; Thence N 38° 52' 39" W by and along the southwesterly side of said building, a distance of 12.72 feet to the most westerly corner of said building;

Thence N 51° 07' 14" E by and along the northwesterly side of said building, a distance of 9.82 feet to a chain link fence; Thence N 38° 52' 46" W by and along said chain link fence, a distance of 17.18 feet to an angle point in said fence, said point is further described as being the northwesterly corner of the aforementioned substation parcel;

Thence S 59° 55' 52" W along a line the crosses Millinocket Stream, so called, a distance of 217.52 feet to a corner of the Power Station Parcel;

Thence S 38° 57' 48" E by and along said Power Station Parcel, a distance of 23.93 feet to a corner of said parcel; Thence S 52° 15' 29" W by and along said Power Station Parcel, a distance of 77.33 feet to a corner of said parcel;

Thence S 38° 57' 48" E by and along said Power Station Parcel, a distance of 239.60 feet to the most easterly corner of said parcel;

Thence N 57° 47' 33" E along a line that crosses back over said Millinocket Stream, a distance of 237.05 feet to the point of beginning. Transmission Line Easement Area 6 contains 1.60 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

4.4.6 Transmission Line Easement Easement Area 7

Millinocket Mill Site

A certain lot or parcel of land with buildings and improvements thereon situated in Millinocket, Penobscot County, Maine for a Transmission Line Easement and for the right to transmit intelligence and communications by wire or fiber, and natural gas, more particularly described as follows:

Beginning at the most northerly corner of Sub-Station No. 1 (A.K.A. the Little Italy Sub-Station), said point of beginning is further described as being at coordinates N: 722,438.69 feet and E: 932,241.62 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence S 50° 52' 36" W by and along the northwesterly line of the aforementioned sub-station a distance of 122.42 feet to the northwesterly corner of said sub-station;

Thence S 59° 55' 52" W by and along Easement Area No. 6 described herein, a distance of 40 feet, more or less, to a point on the easterly edge of Millinocket Stream, so called;

Thence running in a northerly direction by and along the easterly shore of said Millinocket Stream, a distance of 311 feet, more or less, to a point defined by the intersection of the shore of said stream with the next course herein described, said point is further described as being N 0° 18' 17" E, a distance of 300.88 feet from the previously described point on the shore of said stream; Thence S 46° 44' 30" E, a distance of 220 feet, more or less, to a point on the southwesterly line of the Town of Millinocket Pump Station Lot, said pump station lot is described as Lot 2 in a deed recorded at the Penobscot Registry of Deeds in Volume 2656, Page 165;

Thence continuing on the same course S 46° 44' 30" E by and along said Pump Station Lot, a distance of 166.00 feet to the most southerly corner of said lot;

Thence S 54° 51' 47" E, a distance of 4083.25 feet to an angle point in said easement line; Thence N 87° 41' 48" E, a distance of

343.00 feet to an angle point in said easement line;

Thence S 54° 47' 01" E, a distance of 2322.71 feet to a point defined by the intersection of said easement line with the northwesterly line of land of the Inhabitants of the Town of Millinocket (Treatment Plant Site) as described in a deed recorded at the Penobscot Registry of Deeds in Volume 2656, Page 165;

Thence S 52° 19' 30" W, by and along the northwesterly line of said Treatment Plant Site, a distance of 214.89 feet to an angle point in said easement;

Thence S 54° 51' 47" E, a distance of 700.92 feet to a #6 rebar found at a corner of the easement herein described; Thence S 31° 51' 43" W, a distance of 320.62 feet to an angle point in the easement herein described;

Thence S 54° 48' 17" E by and along the southwesterly line of a Bangor Hydro-Electric Company easement identified as Easement Strip "C" in a deed recorded at the Penobscot Registry of Deeds in Volume 2974, Page 238, a distance of 2446.02 feet to an angle point in said Bangor Hydro-Electric Company easement, said angle point is located on a small island in the middle of the Penobscot River, so called, said angle point is further described as being located at coordinates N: 716,485.25 feet and E: 940,207.03 of the aforementioned coordinate system;

Thence S 50° 32' 17" E by and along the southwesterly line of said Bangor Hydro-Electric Company easement, a distance of 387 feet, more or less, to a point defined by the intersection of said easement with the town line between Millinocket and T3 Indian Purchase;

Thence running in a southwesterly direction by and along said town line, a distance of 206 feet, more

or less, to a point on said town line that is 200.00 feet southwesterly as measured on a line that is perpendicular to the previous course herein described, said point is further described as being S 26° 06' 55" W, a distance of 205.55 feet from the previously described point on said town line;

Thence N 50° 32' 17" W by and along a line that is parallel to and 200 feet southwesterly of the northeasterly line of the easement herein described, a distance of 427 feet, more or less, to an angle point located on said island in the said Penobscot River; Thence N 54° 48' 17" W, a distance of 3245.39 feet to an angle point in the easement herein described, said angle point is near a waste treatment lagoon located on the Millinocket Mill Site;

Thence N 35° 11' 55" E, a distance of 252.73 feet to an angle point in the easement herein described;

Thence N 54° 48' 05" W, a distance of 2125.62 feet to an angle point in the easement herein described, said point is also described as being a corner of Easement Area 1 herein described, said point is further described as being located at coordinates N: 719,628.40 feet and E: 935,842.27 feet of the aforementioned coordinate system;

Thence N 21° 07' 38" W by and along said Easement Area 1, a distance 125.00 feet to an angle point in the line of said easement; Thence N 54° 50' 00" W by and along said Easement Area 1, a distance 468.59 feet to an angle point in the line of said easement; Thence N 54° 50' 00" W, a distance of 1952.83 feet to a corner of Easement Area 1 herein described;

Thence N 71° 00' 43" W by and along said Easement Area 1 herein described, a distance of 116.18 feet to an angle point in the line of said easement;

Thence N 56° 22' 20" W, a distance of 1222.83 feet to an angle point in the southwesterly line of the easement herein described; Thence N 44° 06' 44" W, a distance of 453.14 feet to a point on the southeasterly line of Sub-Station No. 1 (A.K.A. the Little Italy Sub-Station);

Thence N 51° 37' 37" E by and along the southeasterly line of said sub-station, a distance of 26.41 feet to the most easterly corner of said sub-station;

Thence N 38° 31' 45" W by and along the northeasterly side of said sub-station, a distance of 158.96 feet to an angle point; Thence N 19° 18' 10" W by and along the northeasterly side of said sub-station, a distance of 93.99 feet to an angle point; Thence N 31° 53' 38" W by and along the northeasterly side of said sub-station, a distance of 11.06 feet to an angle point; Thence N 41° 16' 11" W by and along the northeasterly side of said sub-station, a distance of 26.44 feet to the point of beginning.

SUBJECT to prior easement rights of Bangor Hydro-Electric Company as described in deeds recorded at the Penobscot Registry of Deeds in Volume 2974, Page 238 from easement strips "A", "B" and "C".

SUBJECT to sewer line easements granted to the Inhabitants of the Town of Millinocket in a deed recorded at the Penobscot Registry of Deeds in Volume 2790, Page 221.

Transmission Line Easement Area 7 contains 69.23 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

4.5 Transmission Line Easement North Twin Dam to Millinocket Mill

T3 Indian Purchase, Maine and Millinocket, Maine

The following is a description of a 200 foot wide right of way for a Transmission Line Easement and for utility services as defined in Title 33 M.R.S.A. §458, excluding gas, diesel, natural gas, fuel and any

other petroleum products, but including the right to transmit utilities, energy, electricity and intelligence, which said transmission line easement is 100 feet either side of the following described centerline, and said transmission line easement is located in the T3 Indian Purchase and Millinocket in the County of Penobscot, State of Maine and is more particularly described as follows:

Beginning at a point on the centerline of the said transmission line in T3 Indian Purchase, said point further described as being located at coordinates of N: 718,411.25 feet, E: 912,508.58 feet of the Maine State Plane Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence N 58° 38' 19" E along the centerline of the herein described easement, a distance of 1032.42 feet to an angle point in said centerline;

Thence N 54° 10' 27" E along the centerline of the herein described easement, a distance of 5462.77 feet to an angle point in said centerline;

Thence S 51° 31' 23" E along the centerline of the herein described easement, crossing the Bangor & Aroostook Railroad right of way, a distance of 179.28 feet to an angle point in said centerline;

Thence N 79° 33' 13" E along the centerline of the herein described easement, crossing from T3 Indian Purchase into the Town of Millinocket, a distance of 7618.13 feet to an angle point in said centerline;

Thence N 77° 35' 59" E along the centerline of the herein described easement, a distance of 820.67 feet to an angle point in said centerline;

Thence S 73° 50' 43" E along the centerline of the herein described easement and crossing State Route 11, a distance of 673.82 feet to an angle point in said centerline;

Thence N 89° 06' 22" E along the centerline of the herein described easement a, distance of 813 feet, more or less, to the terminus of said easement located at coordinates N: 723,417.29 feet, E: 927,713.30 feet, as referenced to the aforementioned coordinate system;

SUBJECT to rights of the Bangor & Aroostook Railroad Company for the right of way that passes through and across the transmission line described herein.

SUBJECT to the rights of the public for the State Route 11 that cross the easement line described herein.

EXCEPTING AND RESERVING rights of access granted to the Millinocket Water District described in the following deeds: Book 716, Page 399; Book 1449, Page 371; Book 1543, Page 100; Book 5298, Page 326; and Book 5298, Page 327.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet, E: 977,164.59 feet which are based on the 1992 readjustment.

4.6 Transmission Line Easement Ripogenus Transmission Line:

A certain strip of land for a Transmission Line Easement and for utility services as defined in Title 33 M.R.S.A. §458, excluding gas, diesel, natural gas, fuel and any other petroleum products, but including the right to transmit utilities, energy, electricity and intelligence and containing electrical transmission cables, being always 200.00 feet wide and extending from Route #11 in Millinocket to McKay Station. Said land being part of that now or formerly owned by GNP, and the centerline of said 200.00 foot wide strip being described more particularly as follows:

Beginning at a rebar set on the northerly Right-of-Way of said Route #11 and also being on the centerline of a 200 foot wide utility transmission line now or formerly owned by GNP, located at UTM coordinates N 16584999.61, E 1711644.04 feet;

Thence, along the centerline of said Transmission Line and crossing the Golden Road at a UTM Grid bearing of North 46°22'10" West and a distance of 1332.33 feet to a bend in said Transmission Line; Thence, along said Centerline and crossing, the Bangor and Aroostook Railroad and the Town Line between T3 Indian Purchase and Millinocket, North 44°05'20" West, a distance of 11641.68 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline and crossing the State Park Road, North 39°39'40" West, a distance of 4082.90 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline and crossing Smith Brook, North 54°14'10" West, a distance of 4156.56 feet to a rebar set on the Town Line between T3 Indian Purchase and T1 R8;

Thence, continuing along said Centerline and crossing the Town Line between T1 R8 and T1 R9 and the State Park Road, North 54°08'10" West, a distance of 15987.20 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline and crossing the State Park Road, North 19°26'30" West, a distance of 1923.77 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 20°00'20" West, a distance of 381.55 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 21°47'50" West, a distance of 578.73 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 21°59'10" West, a distance of 345.70 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline and crossing Twin Pines Camp Road, North 18°21'10" West, a distance of 800.24 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline and crossing Millinocket Lake, North 16°37'00" West, a distance of 819.20 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline and crossing the boat launch parking lot and the State Park Road, North 42°49'00" West, a distance of 873.42 feet to a rebar set at a bend in said Transmission Line; Thence, continuing along said Centerline and crossing the Golden Road, North 49°59'40" West, a distance of 3045.80 feet to a rebar set at a bend in said Transmission Line at UTM Coordinates N 16616393.18, E 1679116.86;

Thence, continuing along said Centerline and crossing the Sawdust Pile Road and the Smelting Road, North 28°15'10" West, a distance of 6689.51 feet to a rebar set at a bend in said Transmission Line; Thence, continuing along said Centerline and crossing the Town Line between T1 R9 and T2 R9 and Grant Brook, North 45°00'00" West, a distance of 6032.56 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline and crossing the Golden Road, the State Park Road, Pockwockamus Brook, and Sunday Pond Road, North 19°21'00" West, a distance of 14301.76 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline and crossing the State Park Road and the Abol Dump Road, North 47°58'20" West, a distance of 15095.47 feet to a rebar set at a bend in said Transmission Line at UTM Coordinates N 16650151.49, E 1655732.74; Thence, continuing along said Centerline and crossing the Town Line between T2R9 and T2R10, North 69°43'40" West, a distance of 4827.27 feet

to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline and crossing the Abol Dump Road, the Golden Road, and the West Branch of the Penobscot River, North 89°07'30" West, a distance of 2824.47 feet to a rebar set at a bend in said Transmission Line; Thence, continuing along said Centerline and crossing the Golden Road and the Old Golden Road, North 75°33'40" West, a distance of 4123.87 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 70°38'50" West, a distance of 1148.84 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline and crossing the Golden Road and the Pitman Mountain Road, North 75°33'20" West, a distance of 3929.15 feet to a rebar set at a bend in said Transmission Line; Thence, continuing along said Centerline, North 80°27'40" West, a distance of 1180.96 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 75°33'00" West, a distance of 863.59 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 75°29'20" West, a distance of 504.03 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 75°39'20" West, a distance of 2340.82 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 75°37'30" West, a distance of 1413.83 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, South 82°22'20" West, a distance of 1924.02 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, South 83°24'50" West, a distance of 447.04 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, South 81°35'30" West, a distance of 424.25 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, South 82°40'10" West, a distance of 3405.38 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 73°40'30" West, a distance of 511.71 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 73°13'20" West, a distance of 2462.84 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 74°07'50" West, a distance of 535.96 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline and crossing the old Golden Road, North 40°41'10" West, a distance of 806.57 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline and crossing Horserace Brook, North 40°41'20" West, a distance of 745.99 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline and crossing the old Golden Road, North 40°25'20" West, a distance of 1367.76 feet to a rebar set at the Town Line between T2R10 and T2R11 in said Transmission Line;

Thence, continuing along said Centerline, North 40°46'20" West, a distance of 622.23 feet to a rebar set at the Town Line between T2R11 and T3R11 on said Transmission Line;

Thence, continuing along said Centerline, North 40°54'00" West, a distance of 598.21 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 45°14'30" West, a distance of 444.11 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 49°27'50" West, a distance of 313.15 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 51°54'10" West, a distance of 386.71 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 56°37'30" West, a distance of 541.85 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 61°28'50" West, a distance of 848.06 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 61°04'20" West, a distance of 466.37 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 61°55'30" West, a distance of 562.86 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 66°46'50" West, a distance of 2098.80 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 61°42'00" West, a distance of 458.69 feet to a rebar set at a bend in said Transmission Line at UTM Coordinates N 16662057.98, E 1615868.82;

Thence, continuing along said Centerline, North 61°13'20" West, a distance of 3128.87 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 56°32'10" West, a distance of 1266.06 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 61°33'00" West, a distance of 508.27 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 61°35'10" West, a distance of 1067.68 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 61°04'10" West, a distance of 437.48 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline and crossing the Golden Road, North 61°33'30" West, a distance of 1803.35 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, 61°26'10" West, a distance of 1060.10 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline and crossing the Golden Road, South 86°03'20" West, a distance of 446.97 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, 86°24'30" West, a distance of 894.26 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, South 86°38'50" West, a distance of 2373.81 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, South 86°20'40" West, a distance of 1377.78 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline and crossing the Golden Road, North 80°32'20" West, a distance of 1757.45 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline, North 67°31'50" West, a distance of 598.13 feet to a rebar set at a bend in said Transmission Line;

Thence, continuing along said Centerline and crossing the McKay Station Road and the Surge Tank Road, North 67°48'00" West, a distance of 1318.97 feet to a rebar set at the 3 pole structure at the end of said Transmission Line and also being the POINT OF ENDING.

The above described parcel of land is based on a field survey conducted under the supervision of Daniel O. Bridgham, PLS #1027, and shown on Plats labeled one of four through four of four dated May 19, 2000. All bearings are by GPS. All monuments set were 5/8 inch metal rebar with yellow plastic caps affixed to them, with "D. Bridgham, PLS #1027" imprinted in the caps.

4.7 Transmission Line Easement

TA R7 WELS Transmission Line (Parcel A):

A certain lot or parcel of land for a Transmission Line Easement and for utility services as defined in Title 33 M.R.S.A. §458, excluding gas, diesel, natural gas, fuel and any other petroleum products, but including the right to transmit utilities, energy, electricity and intelligence, situated in TA R7 WELS in the county of Penobscot, State of Maine, said easement area is more particularly described as follows:

Beginning at the southwesterly corner of the above described Sub-Station Parcel and on the southerly line of an 80 foot wide Bangor Hydro-Electric Company easement described as Strip D in a deed of easement recorded at the Penobscot Registry of Deeds in Volume 2974, Page 238, said point of beginning is further identified as being located at coordinates of N: 711,166.37 feet, E: 963,544.42 feet of the Maine State Plane Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence N 21° 12' 49" E by and along the westerly line of said Sub-Station Parcel, a distance of 250.10 feet to a point on said line; Thence N 85° 07' 38" W, a distance of 964.02 feet to a point on the southwesterly line of an 80 foot wide Bangor Hydro-Electric Company easement described as Strip D in a deed of easement recorded at the Penobscot Registry of Deeds in Volume 2974, Page 238;

Thence N 51° 57' 23" W by and along the southwesterly line of said Bangor Hydro-Electric Company 80 foot wide easement, a distance of 5558.65 feet to an angle point in said 80 foot wide easement;

Thence N 56° 17' 53" W by and along the southwesterly line of said Bangor Hydro-Electric Company 80 foot wide easement, a distance of 941.65 feet to an angle point in said 80 foot wide easement;

Thence N 58° 25' 02" W by and along the southwesterly line of said Bangor Hydro-Electric Company 80 foot wide easement, a distance of 816.40 feet to an angle point in said 80 foot wide easement, said angle point is further described as being southwesterly of Dolby Dam, so called;

Thence N 85° 11' 04" W by and along the southerly line of said Bangor Hydro-Electric Company 80 foot wide easement, a distance of 1932.9 feet, more or less to a point defined by the intersection of said line with the easterly line of land now or formerly of Webber Timberlands;

Thence S 5° 09' W, more or less, by and along land of said Webber Timberlands, a distance of 200 feet, more or less, to a point on the southerly line of the easement herein described, said point is further described as being 200.00 feet southerly as measured on a line that is perpendicular to the last

course herein described;

Thence S 85° 11' 04" E, a distance of 1886.5 feet, more or less, to an angle point in the southerly line of the easement parcel herein described, said angle point is further described as being southwesterly of Dolby Dam, so called;

Thence S 58° 25' 02" E, a distance of 765.11 feet to an angle point in the southwesterly line of the easement parcel herein described;

Thence S 56° 17' 53" E, a distance of 930.37 feet to an angle point in the southwesterly line of the easement parcel herein described;

Thence S 51° 57' 23" E, a distance of 6049.29 feet to an angle point in the southwesterly line of the easement parcel herein described;

Thence S 85° 07' 38" E, a distance of 3706.47 feet to a point on the southwesterly line of a 120 foot wide transmission line easement that runs from the Weldon Dam, so called, to East Millinocket;

Thence N 58° 33' 11" W by and along the southwesterly line of said 120 foot wide transmission line, a distance 447.07 feet to a point on said line, said point is further described as being on the southerly line of an 80 foot wide Bangor Hydro-Electric Company easement described a deed of easement from Powers et al recorded at the Penobscot Registry of Deeds in Volume 2150, Pages 564 and 566;

Thence N 85° 07' 38" W by and along the southerly line of said Bangor Hydro-Electric Company easement granted by said Powers et al and the southerly line of an 80 foot wide Bangor Hydro-Electric Company easement described as Strip D in a deed of easement recorded at the Penobscot Registry of Deeds in Volume 2974, Page 238, a distance of 1676. 43 feet to a point on the southerly line of said Bangor Hydro-Electric easement; said point is further described as being the southeasterly corner of aforementioned Sub-Station Parcel;

Thence continuing on the same course N 85° 07' 38" W by and along the southerly line of said Sub-Station Parcel, a distance of 1044.15 feet to the point of beginning.

SUBJECT to prior easement rights of Bangor Hydro-Electric Company as described in deeds recorded at the Penobscot Registry of Deeds in Volume 2974, Page 238 and Volume 2150, Pages 564 and 566.

The above described area contains 64.42 acres, more or less.

4.8 Optional Transmission Line Easement - intentionally omitted TA R7 WELS, Medway, T2 R9 NWP

NOTE: Reference is made to the Easement Agreement, Release of Option and Confirmatory Release Deed by and among GNP, MTC & GLHA dated January 2, 2003 and recorded in Penobscot County Registry of Deeds in Book 8532, Page 256.

4.9 Transmission Line Easement

T3 Indian Purchase Transmission Line (Parcel C):

A certain lot or parcel of land being a 200 foot wide strip of land for a Transmission Line Easement and for utility services as defined in Title 33 M.R.S.A. §458, excluding gas, diesel, natural gas, fuel and any other petroleum products, but including the right to transmit utilities, energy, electricity and intelligence situated in T3 Indian Purchase in the county of Penobscot State of Maine, said easement area is more particularly described as follows:

Beginning at a point on the town line between T3 Indian Purchase and TA R7 WELS, said point is further described as being located S 11° 43' E, more or less, as measured along said town line a distance of 40 feet, more or less, from the center of an 80 foot wide Bangor Hydro-Electric Co. easement described in a deed from the Webber heirs and recorded at the Penobscot Registry of

Deeds in Volume 2161, Page 364, said point of beginning is further identified as being located at coordinates of N: 715,990.26 feet, E: 940,839.23 feet of the Maine State Plane Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence S 77° 33' 30" W by and along the southerly line of a Bangor Hydro-Electric Company 80 wide easement identified as "Strip C" in a deed recorded at the Penobscot Registry of Deeds in Volume 2974, Page 238, a distance of 25 feet, more or less, to an angle point in said easement;

Thence N 50° 32' 17" W by and along the southerly line of said Bangor Hydro-Electric Company easement, a distance of 400 feet, more or less, to a point defined by the intersection of said line with the thread of the Penobscot River, said point is further described as being the bound between the towns of Millinocket and T3 Indian Purchase;

Thence running in a southwesterly direction by and along said town line, a distance of 206 feet, more or less, to a point defined by the intersection of said town line with a line that is 200 feet southwesterly as measured on a line that is perpendicular to the previous course herein described;

Thence S 50° 32' 17" E, a distance of 450 feet, more or less, to an angle point in said easement;

Thence N 77° 30' 30" E, a distance of 120 feet, more or less, a point defined by the intersection of the line herein described with the westerly line of land now or formerly of Webber heirs, said point is further described as being on the town line between TA R7 WELS and T3 Indian Purchase;

Thence N 11° 43' W, more or less, by and along the town line between TA R7 WELS and T3 Indian Purchase, a distance of 200 feet, more or less, to the point of beginning.

The above described parcel of land contains 2.3 acres, more or less.

4.10 Assignment of Rights under Easement Deed and Agreement

KPC and KT assign to GLHA their rights with respect to transmission line easements described in paragraphs 2 and 3 of a certain Deed, Easement Deed and Agreement between John M. Webber and Bangor Savings Bank et al. and GNP, MTC and GNE, dated as of December 27, 2001 and recorded in the Penobscot County Registry of Deeds in Book 8031, Page 39, and the Piscataquis County Registry of Deeds in Book 1360, Page 79.

4.11 Conditional Assignment of Rights to Require Removal of Rails and Reversion

With respect to the foregoing transmission line easements described in Paragraphs 4.1 to 4.10, which cross parcels now owned by Bangor & Aroostook Railroad ("B&A"), subject to the conditions below, KPC assign to GLHA all rights granted under the deeds listed below and recorded in the Penobscot County Registry of Deeds in the book and page indicated, to require removal of the rails and to compel a reverter of such parcels to KPC:

Book 703, Page 151 - Deed from Great Northern Paper Company to Bangor & Aroostook Railroad dated April 9, 1901.

Book 756, Page 141 - Deed from Great Northern Paper Company to Bangor & Aroostook Railroad dated September 11, 1905. Book 770, Page 299 - Deed from Great Northern Paper Company to Schoodic Stream Railroad Company dated June 20, 1907. Book 774, Page 332 - Deed from Great Northern Paper Company to Bangor & Aroostook Railroad dated March 7, 1908.

Book 810, Page 310 - Deed from Great Northern Paper Company to Bangor & Aroostook Railroad Company dated June 20, 1910. Book 810, Page 443 - Deed from Great Northern Paper Company to Bangor & Aroostook Railroad dated November 11, 1910.

Book 824, Page 243 - Deed from Great Northern Paper Company to Bangor & Aroostook Railroad dated September 6, 1911. Book 824, Page 335 - Deed from Great Northern Paper Company to Bangor & Aroostook Railroad dated September 29, 1911. Book 832, Page 242 - Deed from Great

Northern Paper Company to Bangor & Aroostook Railroad dated August 9, 1912.

Book 934, Page 93 - Deed from Great Northern Paper Company to Bangor & Aroostook Railroad dated April 12, 1921.

Book 982, Page 219 - Deed from Great Northern Paper Company to Bangor & Aroostook Railroad dated December 29, 1925. Deed dated September 20, 1929 and recorded in Book 1032, Page 309 of the Penobscot County Registry of Deeds.

Book 1054, Page 172 - Deed from Great Northern Paper Company to Bangor & Aroostook Railroad Company dated June 18, 1931.

Book 1054, Page 173 - Deed from Great Northern Paper Company to Bangor & Aroostook Railroad dated June 8, 1931. Book 1054, Page 243 - Deed from Great Northern Paper Company to Bangor & Aroostook Railroad dated June 22, 1931. Deed dated July 13, 1934 and recorded in Book 1080, Page 471 of the Penobscot County Registry of Deeds.

Book 1103, Page 273 - Deed from Great Northern Paper Company to Bangor & Aroostook Railroad Company dated November 19, 1935.

Deed dated May 6, 1938 and recorded in Book 1133, Page 165 of the Penobscot County Registry of Deeds. Deed dated April 29, 1948 and recorded in Book 1283, Page 336 of the Penobscot County Registry of Deeds. Deed dated April 29, 1948 and recorded in Book 1283, Page 338 of the Penobscot County Registry of Deeds.

Book 1683, Page 25 - Deed from Great Northern Paper Company to Bangor & Aroostook Railroad dated June 25, 1959.

Book 1683, Page 27 - Deed from Great Northern Paper Company to Bangor & Aroostook Railroad Company dated June 25, 1959. Book 1803, Page 392 - Deed from Great Northern Paper Company to Bangor & Aroostook Railroad dated September 26, 1961.

SUBJECT TO the condition that in the event that:

(a) B&A asserts that the transmission lines located within such easements must be removed, and

(b) KPC fails to assert its right to require removal of the B&A rails and to compel a reverter of the parcels described in such deeds to KPC, then GLHA may assert such right as KPC's assignee.

**5. DAM LOT INCLUSIONS**

Also, all of GLHA's right, title and interest in and to the following grant:

As to all properties containing dam lots also:

(a) Whether or not described elsewhere herein, all beds of dam impoundments, except for the Dolby and East Millinocket impoundments, where parcels above the high water mark of the impoundments are conveyed and GNP held title to flowed lands below such high water mark, or KPC holds title to flowed lands below such high water mark; and

(b) All flowage rights, whether acquired by Legislative Charter, by deed, by prescription or otherwise, over lands located upstream or downstream of the dam that, historically or currently, have been flowed or flooded by a dam in Somerset, Penobscot, Piscataquis or Aroostook Counties.

**6. RESERVED EASEMENTS**

Also, all of GLHA's right, title and interest in and to the following grant, and excepting the interests reserved therein: RESERVING, however, to KPC and KT, the following easements described in Paragraph 6.1 to 6.4, SUBJECT TO the following conditions:

(1) Use of the easements shall be at the sole risk of the easement user;

(2) The easement user shall obtain and maintain in full force and effect all governmental approvals and financial responsibility requirements required by all applicable laws for construction and use of the easements;

(3) GLHA shall have the right to use the areas subject to such easements in common with KPC and KT and may cross and recross such areas with persons, equipment and vehicles;

(4) Use of the easement areas shall be in accordance with applicable laws and regulations and subject to modification from time to time pursuant to FERC License or other governmental action.;

(5) KPC's and KT's use of the easements shall not interfere with the use of GLHA's property in the ordinary conduct of the operation and management of a hydroelectric system;

(6) Except to the extent specifically provided in Paragraph 6.1, KPC's and KT's use and exercise of the easements shall be consistent with their prior use of real estate and fixtures subject to the easement, and not a change of use unless GLHA consents in writing to a change of use of the easements, which consent may be withheld for any reason; and

(7) KPC and KT severally agree for themselves, their successors and assigns, to indemnify and hold harmless GLHA, its successors and assigns, from any and all liability, costs, harm, damage and expense to GLHA relating to the exercise by KPC, KT, or their respective successors or assigns, of their rights under these easements.

6.1 Sunk Wood Easement

An easement to remove any sunk wood located within impoundments conveyed to GNE, which sunk wood KPC, KT, and GLHA agree to treat as personal property of KPC, pursuant to 33 M.R.S.A. § 455, 12 M.R.S.A. § 1867 and any applicable regulations, including an easement for ingress and egress across lands now or in the future owned by GLHA, or its successors or assigns, and including the right to operate watercraft and other machinery as may be reasonably required to exercise said easement rights, provided that all such removal shall be in accordance with all applicable licenses, laws, codes, ordinances and other governmental requirements, and performed in a good and workmanlike manner.

6.2 Slurry Pipeline Easement

A fifty foot (50') wide easement, centered on a slurry pipeline currently existing (the "Pipeline Easement"), for the purpose of laying, constructing, maintaining, operating, altering, replacing, repairing, reconstructing, relocating, and removing, (i) one or more pipelines with above-grade or below-grade valves, fittings and (ii) pipeline data acquisition equipment, pipeline safety devices, pipeline markers and other appurtenances, all of which KPC, KT, and GLHA agree shall be and remain the property of KPC, pursuant to 33 M.R.S.A. § 455, as may be convenient or necessary for the manufacture of pulp or paper, over, under, through, across, and upon any premises conveyed to GLHA and situated in Millinocket, Township A Range 7 W.E.L.S., or East Millinocket, Penobscot County, Maine. The easement rights granted herein shall include the rights (i) to use and maintain the existing roadway within said easement to permit the inspection and maintenance of the pipeline; (ii) altering, enlarging, and replacing, repairing, and removing the pipeline within said easement, and (iii) the rights to clear said easement, to remove any trees adjacent thereto, which at the discretion of the Grantee are a menace to the operation of the pipeline or lines.

6.3 Calcium Pond at North Twin Dam

An easement to store and remove calcium chloride from a storage pond located on the North Twin Dam Parcel described above in Paragraph 3.2, which calcium chloride KPC, KT, and GLHA agree to treat as personal property of KPC and KT, pursuant to 33

M.R.S.A. § 455, including an easement for ingress and egress on foot and by vehicle across such North Twin Dam parcel as may be reasonably required to exercise said easement rights. The storage pond is located within the parcel described below:

Calcium Pond Exception Parcel

North Twin Dam Site Twp 3 Indian Purchase

Beginning at a point on the northerly right of way line of the Bangor & Aroostook Railroad right of way, said point of beginning is 533 feet as measured northeasterly along said railroad right of way from the southwesterly corner of the North Twin Dam Parcel, so called said point of beginning is further described as being located at coordinates of N: 717,132.19 feet, E: 912,867.98 feet of the Maine State Plane Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence N 21° 24' 30" W, a distance of 105.8 feet to the northwesterly corner of the parcel herein described; Thence N 57' 33' 15" E, a distance of 105.0 feet to the northeasterly corner of the parcel herein described;

Thence S 17° 21' 15" E, a distance of 118.4 feet to a point on the northerly line of the said Bangor & Aroostook Railroad right of way;

Thence running in a southwesterly direction by and along said right of way following a 1860.14 foot radius curve to the right, an arc distance of 95.0 feet to the point of beginning.

ALSO granting herewith, a right of way over, under or through the existing road that runs from the parcel herein described to the northwesterly sideline of State Route 11, so called.

The above described parcel contains 0.25 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet, E: 977,164.59 feet which are based on the 1992 readjustment.

6.4 Storage Area at Dolby Dam

An easement for purposes of storage of equipment, consistent with prior use by GNP, in an existing building located in East Millinocket on the Dolby Dam parcel described in Paragraph 3.14.1 of this deed, including an easement for ingress and egress on foot and by vehicle across said Dolby Dam parcel as may be reasonably required to exercise said easement rights.

**7. APPURTENANT EASEMENTS AS TO ALL PROPERTIES (AS APPLICABLE)**

Also, all of GLHA's right, title and interest in and to the following grant:

TOGETHER WITH a non-exclusive easement over, under or through the land conveyed by GNP to (a) Somerset Woodlands, LLC by deed dated March 30, 1999 and recorded in Book 2541, Page 221 of the Somerset County Registry of Deeds, and (b) Great Northwoods, LLC by deed dated March 30, 1999 and recorded in Book 1191, Page 326 for access, ingress and egress between each of the "Reserved Parcels" described in said deeds and the roads and other transportation easement areas reserved in said deeds and to provide such other rights in said land as are reasonably necessary for GLHA, its successors and assigns, to operate, service and maintain the facilities on the parcels hereby conveyed in a manner substantially consistent with GNP's past practices, subject to modification from time to time pursuant to FERC license or other governmental action.

**8. RESERVED EASEMENTS ACROSS LANDS OF KT**

Also, all of GLHA's right, title and interest in and to the following grant:

TOGETHER WITH a non-exclusive easement over, under or through properties formerly owned by MTC or now owned by KT and conveyed by GNP to MTC by deeds dated January 5, 2001, and recorded in the Penobscot County Registry of Deeds in Book 7580, Page 284 and in the Piscataquis County Registry of Deeds in Book 1295, Page 3, and dated January 10, 2001, and recorded in the Somerset County Registry of Deeds in Book 2757, Page 14, as corrected by corrective deed dated September 6, 2001, from GNP to MTC, and recorded in the Penobscot County Registry of Deeds in Book 7866, Page 135, by corrective deed dated September 6, 2001, from GNP to MTC, and recorded in the Penobscot County Registry of Deeds in Book 7866, Page 143, by corrective deed dated September 6, 2001, from GNP to MTC, and recorded in the Piscataquis County Registry of Deeds in Book 1336, Page 199, by corrective deed dated September 6, 2001, from GNP to MTC, and recorded in the Piscataquis County Registry of Deeds in Book 1336, Page 207, by corrective deed dated September 6, 2001, from GNP to MTC, and recorded in the Somerset County Registry of Deeds in Book 2851, Page 19, by corrective deed dated September 6, 2001, from GNP to MTC, and recorded in the Somerset County Registry of Deeds in Book 2851, Page 27, and further corrected by corrective deeds from GNP to MTC dated January 30, 2002 and recorded in the Piscataquis County Registry of Deeds in Book 1365, Page 336; recorded in the Penobscot County Registry of Deeds in Book 8063, Page 89 (all of the foregoing, collectively, "MTC Properties"), for the use of existing vehicle roadways and for the construction and use of vehicle roadways up to thirty-five (35) feet wide for access and ingress to and egress to the Reserved Hydroelectric System, provided that: (a) GLHA shall not cut any trees or timber except those inside any such roadway and any timber cut shall be cut into logs of standard length and decked along the easement for disposal by KT at its sole discretion; (b) KPC and KT shall have the right to use said roadways in common with GLHA and may cross and recross said roadways with persons, equipment, vehicles, logs and timber; (c) any such roadways shall be constructed and used by GLHA in accordance with applicable laws and regulations and with proper drainage; (d) GLHA's use of this easement shall not interfere with the use of KT's property in the ordinary conduct of the operation, management, regeneration and harvesting of a tree farm; (e) GLHA 's use and exercise of this easement shall be consistent with GNP's use of the Reserved Hydroelectric System (as that term is used in the deeds from GNP to MTC referenced above), and not a change of use; and (f) GLHA agrees for itself, its successors and assigns, to indemnify and hold harmless KT, its successors and assigns, from any and all liability, costs, harm, damage and expense to KT relating to the exercise by GLHA, or its successors or assigns, of their rights under this access easement.

The foregoing easement is intended to cover all properties now owned by KT in Penobscot, Piscataquis and Somerset Counties, State of Maine.

**9. RESERVED EASEMENTS ACROSS LANDS OF GNP or KPC**

Also, all of GLHA's right, title and interest in and to the following grant:

TOGETHER WITH a non-exclusive easement over, under or through properties formerly owned by GNP or now owned by KPC not otherwise subject to similar easement and described elsewhere in this deed, for the use of existing vehicle roadways and for the construction and use of vehicle roadways up to thirty-five (35) feet wide for access and ingress to and egress to the hydroelectric system hereby conveyed, provided that: (a) GLHA shall not cut any trees or timber except those inside any such roadway and any timber cut shall be cut into logs of standard length and decked along the easement for disposal by KT at its sole discretion; (b) KPC and KT shall have the right to use said roadways in common with GLHA and may cross and recross said roadways with persons, equipment, vehicles, logs and timber; (c) any such roadways shall be constructed and used by GLHA in accordance with applicable laws and regulations and with proper drainage; (d) GLHA's use of this easement shall not interfere with the use of KPC and KT's property in the ordinary conduct of the operation, management, regeneration and harvesting of a tree farm; (e) GLHA 's use and exercise of this easement shall be consistent with GNP's use of the hydroelectric system hereby conveyed, and not a change of use; and (f) GLHA agrees for itself, its successors and assigns, to indemnify and hold harmless KPC, its successors and assigns, from any and all liability, costs, harm, damage and expense to KPC relating to the exercise by GLHA, or its successors or assigns, of their rights under this access easement.

The foregoing easement is intended to cover all properties now owned by KPC in Penobscot County, State of Maine.

**10. GOLDEN ROAD UTILITY EASEMENTS**

Also, all of GLHA's right, title and interest in and to the following grant:

The Golden Road utility easements reserved as set forth in the deeds (a) to Great Northwoods, LLC dated March 30, 1999 and recorded in Book 1191, Page 326 of the Piscataquis County Registry of Deeds, and to Somerset Woodlands LLC dated March 30, 1999 and (b) recorded in Book 2541, Page 221 of the Somerset County Registry of Deeds.

**11. ROAD AND UTILITY EASEMENTS**

Also, all of GLHA's right, title and interest in and to the following grant:

TOGETHER WITH, in common with KPC, KT and others, a perpetual, non-exclusive access easement for passage by foot and vehicle, including construction, logging and other trucks and equipment, over and across all roads and paths as they presently exist or as they may exist from time to time or may in the future be constructed in the property described in deeds from GNP to Great Northwoods, LLC and Somerset Woodlands LLC, recorded in the Piscataquis County Registry of Deeds, Book 1191, Page 326, and the Somerset County Registry of Deeds, Book 2541, Page 221, including without limitation, the Western Portion of the Golden Road, and the non-exclusive right, in common with KPC, KT and others, to use prescriptive rights, easements, licenses, or other rights of KPC or KT over, under or through roads of third parties, including, without limitation, the Western Portion of the Golden Road, to the extent such use does not overburden any such prescriptive right, provided, however, that nothing contained in this easement shall serve to restrict, or be construed to restrict, KPC's or KT's ability to exercise the rights granted by this easement in a manner consistent with the existing and historical exercise of such rights by GNP or its successors.

Each easement user agrees for itself, its successors and assigns, to indemnify and hold harmless the primary easement holder, its successors and assigns, from any and all liability, costs, harm, damage and expense relating to the exercise by the easement user, or its successors or assigns, of their rights under this access easement.

For purposes of the foregoing, "Western Portion of the Golden Road" shall mean the western portion of the Golden Road from the western boundary of the State of Maine to a point on the southern boundary of the East half of Township 3, Range 12, W.E.L.S., and "Golden Road" shall mean the road running westerly from the town of Millinocket, Maine to a point on the Westerly boundary of Township 5, Range 20 at St. Zacharie on the border of Quebec Province, Canada, as more specifically described below.

TOGETHER WITH, in common with KPC, KT and others, a perpetual non-exclusive easement over, under or through the lands along the Eastern Portion of the Golden Road and in areas in the vicinity of the Eastern Portion of the Golden Road, for passage by foot and vehicle, including construction, logging and other trucks and equipment, and provided that the proposed use does not unreasonably interfere with access to the premises owned by KPC or KT, their successors and assigns, and a perpetual exclusive easement (a) to construct (including new utility lines), maintain, operate and upgrade from time to time for electrical transmission and, excepting gas, diesel, natural gas, fuel and any other petroleum products, for utility services as defined in Title 33 M.R.S.A.

§458 ("Utility Services"), one or more lines consisting of overhanging and/or underground wires (including, without limitation, high voltage electric transmission wires and appurtenances), pipes, cables or facilities with necessary or convenient poles, stanchions, fixtures and supports, with the right to transmit utilities, Utility Services excluding gas, diesel, natural gas, fuel and any other petroleum products, energy, electricity and intelligence over and through said lines, and to clear and dispose of interfering branches and other growth from time to time, with permission to enter upon the said lands for the above purposes (whether or not on existing roads now serving, connecting to or traversing said

lines), and (b) to use such easement areas for all purposes related to or arising from use of GLHA's Hydroelectric Easements as defined in Section 15 herein and use of GLHA's hydro system assets. To the extent GLHA reasonably believes that applicable land use or deed restrictions, environmental concerns or construction needs so require, subject to approval of KPC or KT (which approval shall not be unreasonably withheld, delayed or conditioned), the exclusive easement shall extend to areas not in the vicinity of the Eastern Portion of the Golden Road to the extent reasonably required.

KPC and KT shall be under no obligation to perform maintenance of their roads for the improvements of GLHA. Each party using any road, or portions of a road, shall be responsible to maintain and repair, including snow removal, to the extent of such party's use thereof, and each landowner or primary easement holder shall have the right but not the obligation to repair and maintain such road or portion of a road. The landowner shall have the right to relocate from time to time such road or portion of a road at its sole cost and expense. Any such relocation may be done only after reasonable notice, shall be undertaken in such a manner and at such time so as to minimize the disruption of traffic flow and shall not materially impair the utility of this easement, except to the extent required for dam safety and dam security measures. Nothing in this Deed shall limit or modify any right of contribution the parties may have against third parties relative to such costs and expenses. No party shall be required to maintain any roads to any particular standard for the use of third parties.

By its acceptance of this Deed GLHA agrees, for itself, and its successors and assigns, that its entry on land of KT and/or KPC, and use of the Easements shall be SUBJECT TO the following conditions:

(1) GLHA's use of the Easements shall at all times be conducted so as not to materially interfere with the ordinary conduct of the operation, management, regeneration and harvesting of the tree farm on lands of KT and KPC. GLHA use of the Easements shall be subject to rules and regulations adopted by KT and KPC which are generally applicable to users of KT and KPC roads and easements, provided that such rules and regulations and amendments thereto are reasonable. Such rules and regulations may provide for seasonal closures and temporary road closures for construction and maintenance purposes. KT and KPC shall make commercially reasonable efforts to provide notice to GLHA, its successors and assigns, of their rules and regulations.

(2) GLHA's use of the Easements shall be at the sole risk of GLHA. GLHA agrees that KT and KPC shall not be liable to GLHA for any claims arising from use of the Easements by GLHA, its employees, agents, contractors, subcontractors, insurers and its heirs, successors and assigns, including but not limited to claims for personal injury, death, damage to property or loss of business, except to the extent such damage is caused by gross negligence or the willful misconduct of KT, KPC, or their agents, contractors or employees. GLHA agrees to hold harmless KT and KPC, their affiliates, directors, officers, trustees, employees, contractors, successors and assigns from (a) any claims and costs and expenses (including reasonable attorneys' fees) arising from use of the Easements by GLHA or its employees, contractors, agents, successors and assigns, except to the extent caused by the gross negligence or willful misconduct of KT or KPC, their agents, contractors, or employees, and (b) any costs and expenses (including reasonable attorneys' fees) incurred by KT or KPC in connection with curing any default of GLHA hereunder or enforcing KT or KPC's rights under this Deed.

(3) GLHA hereby agrees to indemnify, defend and hold harmless KT and KPC, their affiliates, directors, officers, trustees, employees, successors and assigns from and against any and all claims, actions, injuries, losses, damages, costs, fines, penalties and settlements, including without limitation, attorneys' fees and the costs of investigation, response and remediation, (hereinafter "Claims"), arising from or in any manner related to the construction, reconstruction, use, operation or maintenance of any structures, and transmission lines, or the transportation, loading, unloading, delivery, storage or handling of any material, by GLHA, its contractors, agents, employees, successors or assigns, including without limitation, the release of any hazardous substances (as the same may be defined by federal, state or local law or regulations), natural gas, petroleum products or other fuel in, on or under the premises subject to the easements hereunder, except to the extent such damage is caused by gross negligence or the willful misconduct of KT, KPC, or their agents, contractors or employees.

(4) KT and KPC shall retain title to all merchantable timber and forest products within the Easements and GLHA will not remove merchantable timber or other forest products severed from the Easements without the prior written agreement of KT and KPC.

For purposes of the foregoing, "Eastern Portion of the Golden Road" shall mean the eastern portion of the Golden Road from the southern boundary of the East half of Township 3, Range 12, W.E.L.S. to its eastern terminus in the Town of Millinocket, Maine, at the junction of State Highway Route 11, and "Golden Road" shall mean the road running westerly from the town of Millinocket, Maine to a point on the Westerly boundary of Township 5, Range 20 at St. Zacharie on the border of Quebec Province, Canada, as more specifically described below.

DESCRIPTION OF THE GOLDEN ROAD

The Golden Road is an existing private roadway running generally northwesterly from the Town of Millinocket, Penobscot County,

State of Maine, to a termination on the westerly boundary of T5 R20 WELS and the westerly boundary of the State of Maine, in the counties of Penobscot, Piscataquis and Somerset, being more specifically described as follows:

COMMENCING in the Town of Millinocket, at the junction of State of Maine Highway Route 11, then running generally northwesterly across the Town of Millinocket to the mutual western Townsite boundary and the boundary of Indian Purchase No. 3; Thence running generally northwesterly across Indian Purchase No. 3, southerly of Smith Pond, to the southern boundary of T1 R8 WELS;

Thence running generally northwesterly across the southwest corner of T 1 R 8 WELS to the eastern boundary of T1 R9 WELS; Thence running northwesterly across T1 R9 WELS, crossing over the land area between Ambajejus Lake and Millinocket Lake, to the southern boundary of T2 R9 WELS;

Thence continuing northwesterly from the southern boundary of T2 R9 WELS to the eastern boundary of T2 R10 WELS;

Thence continuing northwesterly from the eastern boundary of T2 R10 WELS, crossing over and running alongside and southerly of the West Branch of the Penobscot River to the eastern boundary of T2 R11 WELS;

Thence continuing northwesterly across the northeast corner of T2 R11 WELS, from the eastern boundary of T2 R11 WELS, to the southern boundary of T3 R11 WELS;

Thence across T3 R11 WELS, northwesterly and westerly along the southern side of the West Branch of the Penobscot River to the eastern boundary of T 3 R 12 WELS, at a point south of the Ripogenus Lake;

Thence southwesterly across T3 R12 WELS, from the eastern boundary of T3 R12 WELS and southeasterly of Chesuncook Lake, to the northern boundary of T2 R12 WELS;

Thence continuing southwesterly across T2 R12 WELS, from the northern boundary of T2 R12 WELS, to the intersection with Kokadjo/Greenville Road, so called, near the southeast corner of Caribou Lake;

Thence turning northwesterly, from above said junction, along the southern and western sides of Caribou Lake, to the southern boundary of T3 R12 WELS;

Thence continuing northwesterly across the southwest corner of T3 R12 WELS, on the western side of said Caribou Lake, to the eastern boundary of T3 R13 WELS;

Thence continuing northwesterly across T3 R13 WELS to the eastern boundary of T3 R14 WELS;

Thence continuing northwesterly and westerly across Lobster Township (T3 R14 WELS), crossing the West Branch of the Penobscot River, at Hannibals Crossing, so-called, to the eastern boundary of

Burbank (Northeast Carry Township or T3 R15 WELS);

Thence continuing across Burbank (Northeast Carry Township or T3 R15 WELS), northerly of the West Branch of the Penobscot River, generally northwesterly and westerly to the eastern boundary of Seboomook (T0 R4 NBKP);

Thence continuing northwesterly across Seboomook (T0 R4 NBKP), to the eastern boundary of Boyd (Plymouth Township or T1 R4 NBKP), at a point northerly of Seboomook Lake;

Thence westerly across Boyd (Plymouth Township or T1 R4 NBKP), northerly of Seboomook Lake, to the eastern boundary of Pittston Academy Grant (T2 R4 NBKP);

Thence northwesterly across the northeastern corner of Pittston Academy Grant (T2 R4 NBKP) to the southern boundary of T4 R17 WELS;

Thence continuing northwesterly across the southwest corner of T4 R17 WELS, to the eastern boundary of T4 R18 WELS (Comstock Township) at a point northeasterly of the North Branch of the Penobscot River;

Thence continuing northwesterly and westerly, from the eastern boundary of T4 R18 WELS (Comstock Township), crossing said North Branch of the Penobscot River, and continuing to the eastern boundary of Dole Brook Township (T3 R5 NBKP);

Thence continuing northwesterly across the northeast corner of Dole Brook Township (T3 R5 NBKP) to the southern boundary of T5 R19 WELS;

Thence continuing northwesterly across the southwest corner of T5 R19 WELS, to the eastern boundary of T5 R20 WELS; Thence continuing northwesterly from the eastern boundary of T5 R20 WELS to said termination on the western boundary of T5 R20 WELS and the western boundary of the State of Maine.

**12. OPTION TO ACQUIRE EASEMENTS OR FEE INTERESTS**

Also, all of GLHA's right, title and interest in and to the following grant:

Also assigning the options reserved under the aforesaid deeds to Somerset Woodlands, LLC and Great Northwoods, LLC set forth in deeds from GNP to Great Northwoods, LLC and Somerset Woodlands LLC, recorded in the Piscataquis County Registry of Deeds, Book 1191, Page 326, and the Somerset County Registry of Deeds, Book 2541, Page 221 as follows:

"Upon request by Grantor, its successors to or assigns of the Hydroelectric System, or any portion thereof, Grantee, or its successors or assigns of the Timberlands described in Part A above, shall grant to Grantor, its successors to or assigns, such easements, rights of way, leases, licenses or rights to use such real property as may be necessary to satisfy requirements that are in the future imposed by FERC, or any successor agency, for the term of any of Grantor's FERC licenses (and any renewals) for the operation of the Hydroelectric System, or any portion thereof, but such easements, rights of way, leases, licenses or rights to use such real property shall extend only to lands within 200 feet of the normal high water mark of any impoundments in the Hydroelectric System. Grantor agrees to make reasonable efforts to avoid having to obtain any such interests in said Timberlands to satisfy such FERC-imposed requirements. In the event that Grantor is not able, after reasonable efforts, to satisfy FERC requirements through use of such easements, rights of way, leases, licenses or rights to use such real property, Grantor shall have the right to acquire title to the minimum amount of such lands as is necessary to satisfy FERC requirements for any of Grantor's Hydroelectric System assets, but such right shall extend only to lands within 200 feet of the high water mark at the N.F.P.E. of any impoundments in the Hydroelectric System. To the extent that Grantor is required to acquire title to any such lands ("Regulatory Requirements Property"), Grantor shall pay Grantee, its successors in or assigns of said Timberlands, an amount equal to the number of measured acres of fee interest comprising such Regulatory Requirements Property multiplied by the fair market value of such

measured acreage. The provisions of this paragraph shall survive the delivery of this deed, but shall lapse after January 1, 2005 for those portions of the Hydroelectric System within the Storage Project, FERC No. P-2634 and shall lapse after January 1, 2001 for all other portions of the Hydroelectric System."

**13. ASSIGNMENT OF SPECIAL CHARTER RIGHTS (ALL COUNTIES) - INTENTIONALLY OMITTED**

**14. FUTURE DEVELOPMENT AREAS RESTRICTIVE COVENANT - INTENTIONALLY OMITTED**

**15. GENERAL PROVISIONS AS TO ALL EASEMENTS BENEFITING GLHA**

Also, all of GLHA's right, title and interest in and to the following grant:

As used in this deed, the term "Hydroelectric Easement" means an easement for supporting, operating, repairing, maintaining, constructing, reconstructing, replacing, dismantling, relocating, inspecting and otherwise utilizing and exploiting any hydroelectric assets now or to be located on the parcel subject to such easement or on any parcel in the hydro system, and including, without limitation, for persons, vehicles, equipment and materials and for ingress and egress and parking.

Notwithstanding any provision contained herein, KPC and KT agree for themselves, their successors and assigns, that GLHA, its successors, and assigns, have the right to perform any and all acts required by an order of the FERC or its successor affecting the conveyed premises without the prior approval of KPC or KT.

KPC and KT agree for themselves, their successors and assigns, to comply with and observe all statutes, ordinances, regulations, orders and/or decrees of the federal, state and city governments, or any departments, bureaus or agencies thereof, in any way affecting the use and maintenance of the premises, or any machinery or equipment therein, whether now in force or which may in the future be promulgated.

With respect to all easements granted in this deed, pursuant to 33 M.R.S.A. § 455, KPC and KT agree to treat all of the fixtures and equipment relating to hydroelectric operations and located within the easement parcels as personal property of GLHA, whether or not affixed to the real estate hereby conveyed, all of which personal property is being conveyed to GLHA by bill of sale of even date herewith. KPC and KT expressly reserve all merchantable timber located within any easement granted in this deed, which merchantable timber shall be the property of KT, its successors and assigns.

GLHA's use of the easements shall not interfere with the use of KPC's property in the ordinary conduct of business or industrial operations.

**16. SUBDIVISION RESTRICTIVE COVENANT - INTENTIONALLY OMITTED**

**17. SHARED ACCESS EASEMENT RIGHTS OVER LAND OF OTHERS**

Also, all of GLHA's right, title and interest in and to the following grant:

To the fullest extent the deeds referenced herein allow, KPC and KT hereby grant to GLHA, in common with KPC, KT, their successors and assigns and others entitled thereto, the following nonexclusive rights of access crossing land of third parties to provide ingress and egress in accordance with the terms and provisions, all as more fully described in the following deeds:

a. Easement granted by Emery Lee and Sons, Inc. to Great Northern Nekoosa Corporation, dated October 23, 1989 and recorded in the Penobscot County Registry of Deeds in Book 4559, Page 127; and

b. Right-of-way granted by Merton Osnoe to Great Northern Paper Company, dated May 4, 1961, and recorded in Penobscot Registry of Deeds in Book 1786, Page 77.

c. Easement Deed and Agreement from G. Pierce Webber, et al., to Great Northern Paper, Inc. dated October 24, 2001 and recorded in Penobscot County Registry of Deeds in Book 7957, Page 339.

d. Deed, Easement Deed and Agreement from John M. Webber, et al., dated December 27, 2001 and recorded in Penobscot County Registry of Deeds in Book 8031, Page 39;

e. Deed, Easement Deed and Agreement from John M. Webber, et al., to Maine Timberlands Company, Great Northern Paper, Inc. and GNE, LLC dated December 27, 2001 and recorded in Piscataquis County Registry of Deeds in Book 1360, Page 79; and

f. Deed, Easement Deed and Agreement from Barbara A. Cassidy, et al., to Maine Timberlands Company, Great Northern Paper, Inc. and GNE, LLC dated December 27, 2001 and recorded in Piscataquis County Registry of Deeds in Book 1360, Page 111.

BLANKET CROSS EASEMENT

Easements conveyed by Great Northern Paper, Inc. to GNE, LLC by Blanket Cross-Easement Deed and Agreement dated January 31, 2002 and recorded in Penobscot County Registry of Deeds in Book 8064, Page 241 upon the Mill Real Estate in East Millinocket and Millinocket, Maine described as follows:

Mill Real Estate

(Millinocket and East Millinocket exclusive of new carve-out areas)

Millinocket Mill Site

A certain lot or parcel of land with the improvements thereon, situate in the Town of Millinocket, County of Penobscot, State of Maine, more particularly described as follows:

BEGINNING at an iron rod set on the generally southerly line of State Route 11, in said Millinocket, which rod is 33 feet right of p.c. station 1349+99.71, as shown on a plan of said highway recorded in Penobscot County Registry of Deeds, Plat Book 21, Page 4; thence generally easterly by and along the southerly line of said highway following a curve to the left with a radius of 1465.69 feet, an arc distance of 766.39 feet to an iron rod set;

thence South 47°18'30" East a distance of 1,550.0 feet to an iron rod set on the westerly extension of the southerly line of Oak Street in said Millinocket, as said street line is shown on plan recorded in Penobscot County Registry of Deeds, Plan Book 6, Page 44;

thence North 60°54'15" East by and along said westerly extension and by and along the southerly line of Oak Street, a distance of 1490.0 feet to the intersection of the southerly line of said Oak Street with the easterly line of Oxford Street;

thence North 29°05'45" West by and along the easterly line of Oxford Street, a distance of 710.0 feet to the southerly line of Elm Street as depicted on said plan recorded in Penobscot County Registry of Deeds, Plan Book 6, Page 44;

thence North 60°54'15" East by and along the southerly line of Elm Street, a distance of 186.0 feet to the northwesterly corner of Lot Number 13, in Book 37, as shown by said plan recorded in Penobscot County Registry of Deeds, Plan Book 6, Page 44; thence South 29°05'45" East by and along the westerly boundaries of Lots Numbered 1 through 13, inclusive of said Block 37, and a continuation of said boundary, a distance of 664.75 feet to point on the westerly extension of the southerly line of Block 59 as said Block is shown on a plan recorded in Penobscot County Registry of Deeds, Plan Book 14, Page 21;

thence North 60°54'15" East along said extension and by and along the southerly line of said Block 59, a distance of 640.67 feet to the easterly line of Congress Street as depicted in the plan recorded in

Penobscot County Registry of Deeds, Plan Book 10, Page 7;

thence North 29°05'45" West a distance of 150.0 feet to the southerly line of Cherry Street, as shown by said plan recorded in Penobscot County Registry of Deeds, Plan Book 10, Page 7;

thence North 60°'54'15" East by and along the southerly line of Cherry Street, a distance of 155.6 feet to a point of curve;

thence southeasterly by a curve to the right with a radius of 135.0 feet, an arc distance of 218.13 feet to a point of tangency which is approximately 35 feet westerly of the easterly line of York Street as said York Street is shown on a plan recorded in Penobscot County Registry of Deeds, Plan Book 16, Page 39;

thence South 26°31 15" East, approximately paralleling the easterly line of York Street as shown by said plan, a distance of 640.1 feet to an iron rod set;

thence South 3°49'15" East, along a line westerly of and approximately paralleling the Coal Ash Road, so-called, a distance of

544.5 feet to an iron rod set;

thence South 87°27'15" East a distance of 44.3 feet to an iron bolt on northerly-most corner of the "Main Pumping Station" lot as depicted on a plan recorded in Penobscot County Registry of Deeds, Map File 569E;

thence southeasterly by a curve to the left in the westerly line of said lot, which curve has a radius of 128.0 feet, an arc distance of

92.17 feet to a point of tangency;

thence South 46°44'30" East by and along the westerly line of said Main Pumping Station lot, a distance of 166.0 feet to an iron bolt;

thence North 16°45'30" East by and along the southerly line of said Main Pumping Station lot, a distance of 3.6 feet to a point on a line which is generally parallel to and 105 feet easterly of the center line of the steel frame towers on the Millinocket-East Millinocket electrical transmission line;

thence South 54°49'45" East by and along said line which is generally parallel to and 105 feet easterly of the center line of the steel frame towers on the Millinocket-East Millinocket electrical transmission line, a distance of 7,317.7 feet to an iron rod set; thence South 31°52'00" East a distance of 1,913.2 feet to an iron rod set;

thence continuing the same course, South 31°E 52'00" East, a distance of 381.7 feet to a point in Millinocket Stream;

thence South 76°52'00" West a distance of 225.8 feet to an aluminum disk cemented into a boulder on the westerly side of said Stream;

thence continuing the same course, South 76°52'00" West, a distance of 8,300.9 feet to an iron road set on the westerly side of the West Branch of Penobscot River;

thence continuing on the same course, South 76°52'00" West, a distance of 315 feet, more or less, to the thread of said River as defined by An Act to Incorporate the Town of Millinocket, Chapter 377, Private and Special Laws of the State of Maine (1901); thence generally northwesterly following the thread of said River as recited by said Act, a distance of 6,203 feet, more or less, to the southeasterly face of the Quakish Lake Dam;

thence northeasterly by the southeasterly face of said dam, a distance of 100 feet, more or less, to the southwesterly fact of a concrete retaining wall on the southerly said of the inlet canal to Ferguson

Lake;

thence southeasterly by and along the southwesterly face of said retaining wall, a distance of 244 feet, more or less, to an angle in said wall;

thence northeasterly by the southeasterly face of said concrete retaining wall, a distance of 30 feet, more or less, to high water line of Ferguson;

thence in a generally easterly and northeasterly direction by and along high water line of Ferguson Lake, a distance of 8.186 feet, more or less, to the westerly end of the outlet canal from Ferguson Lake;

thence northwesterly across the mouth of said canal, a distance of 120 feet, more or less, to high water line of Ferguson Lake; thence generally northwesterly by and along high water line of Ferguson Lake, a distance of 4,312 feet, more or less, to a point which is South 18°57'00" West from p.c. station 1349+99.71, as shown on a plan of said highway recorded in Penobscot County Registry of Deeds, Plan Book 21, Page 4; thence North 18°57'00" East, a distance of 50 feet, more or less, to the point of beginning. For the sole purpose of providing a geometrically precise description, and not to be construed as a boundary of the above described tract, the course and distance between the iron rod defining the point of beginning and the iron rod adjacent to the southwesterly corner of the within described parcel is South 7°03'37" East, 9,270.1 feet.

Bearings referenced herein are oriented to Grid North, Maine State Coordinate System of 1927, East Zone, as determined by a survey of the within described lot by Plisga & Day, Land Surveyors.

Save And Except The Following Millinocket Easement Exception Areas (A) and (B):

3.10.10.1 Easement Exception Area "A" Oil Storage Tanks

Millinocket Mill Site

Beginning at a point on the northerly line of Easement Area 1, so called, having coordinates of N: 719,974.10 feet and E: 933,044.77 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence N 55° 19' 53" E, a distance of 228.63 feet to a point; Thence N 34° 40' 07" W, a distance of 140.92 feet to a point; Thence N 36° 39' 44" E, a distance of 149.89 feet to a point; Thence N 58° 08' 22" E, a distance of 191.75 feet to a point; Thence N 65° 37' 10" W, a distance of 399.04 feet to a point; Thence N 42° 21' 31" W, a distance of 120.86 feet to a point; Thence N 80° 22' 18" W, a distance of 383.03 feet to a point; Thence S 73° 22' 23" W, a distance of 180.33 feet to a point; Thence N 75° 22' 07" W, a distance of 227.85 feet to a point; Thence S 56° 28' 09" E, a distance of 226.35 feet to a point; Thence S 36° 14' 52" E, a distance of 460.18 feet to a point; Thence S 50° 28' 45" W, a distance of 203.63 feet to a point;

Thence S 73° 17' 04" E, a distance of 576.18 feet to the point of beginning. Easement Exception Area "A" contains 10.756 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

3.10.10.2 Easement Exception Area "B"

(Mill Site Southerly to the West Branch of the Penobscot River) Millinocket Mill Site

Beginning at a point on the southwesterly line of Easement Area 7, so called, at its intersection with the southerly line of Easement Area 1, so called, said point having coordinates of N: 719,628.40 feet and E: 935,842.27 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence S 88° 13' 35" W, a distance of 2951.57 feet to a point; Thence N 1° 46' 25" W, a distance of 140.40 feet to a point;

Thence N 74° 01 20" W, a distance of 540.56 feet to a point; Thence N 59° 32' 41" W, a distance of 1103.35 feet to a point;

Thence N 45° 48' 30" W, a distance of 338.76 feet to a point on a chain link fence said point being further described as a point on the southwesterly line Sub-Station No. 4, said point is further described as being located at coordinates of N: 720,621.56 feet and E: 931,174.08 according to aforementioned coordinate system;

Thence N 57°48' 57" W by and along said chain link fence, a distance of 108.74 feet to a corner of said fence;

Thence N 50° 35' 19" W, a distance of 340.90 feet to a point being the southeasterly corner of Easement Area 4, so called, said point having coordinates of N: 720,895.91 feet and E: 930,818.67 feet, according to aforementioned coordinate system; Thence S 49°13' 53" W, a distance of 42.79 feet to a point;

Thence S 49° 00' 52" W, a distance of 288.23 feet to a point; Thence S 56° 04' 37" W, a distance of 110.43 feet to a point; Thence S 18° 32' 03" W, a distance of 28.91 feet to a point; Thence S 48° 27' 21" W, a distance of 147.01 feet to a point; Thence S 44° 00' 30" W, a distance of 746.57 feet to a point; Thence S 62° 19' 46" W, a distance of 450.69 feet to a point; Thence S 53° 33' 03" W, a distance of 152.67 feet to a point; Thence S 41° 32' 21" W, a distance of 128.46 feet to a point; Thence S 24° 52' 06" W, a distance of 293.05 feet to a point; Thence S 14° 25' 23" W, a distance of 309.69 feet to a point; Thence S 38° 08' 40" W, a distance of 319.14 feet to a point; Thence S 61° 10' 40" W, a distance of 153.45 feet to a point;

Thence S 72' 25' 30" W, a distance of 148.60 feet to a point on the Stone Dam Parcel, so called;

Thence S 2° 08' 12" E by and along said Stone Dam Parcel, a distance of 4.61 feet to an angle point in said line; Thence S 61° 53' 43" W by and along said Stone Dam Parcel, a distance of 145.68 feet to an angle point in said line; Thence S 76° 10' 55" W by and along said Stone Dam Parcel, a distance of 118.06 feet to an angle point in said line;

Thence N 82° 02' 56" W by and along said Stone Dam Parcel, a distance of 54.14 feet to its intersection with Easement Area 4, so called;

Thence S 72° 25' 30" W, a distance of 78.92 feet to a point; Thence N 69° 39' 41" W, a distance of 160.69 feet to a point; Thence N 64° 32' 46" W, a distance of 742.30 feet to a point;

Thence N 66° 39' 15" W, a distance of 74.36 feet to a point on the Stone Dam Parcel, so called;

Thence S 75° 45' 01" W by and along said Stone Dam Parcel, a distance of 983.20 feet to an angle point in said line;

Thence N 82° 35' 20" W by and along said Stone Dam Parcel, a distance of 16.89 feet to its intersection with Easement Area 4, so called;

Thence S 63° 57' 44" W, a distance of 40.87 feet to a point; Thence S 89° 04' 15" W, a distance of 104.50 feet to a point;

Thence N 74° 20' 20" W, a distance of 64.29 feet to the southwesterly end of said Easement Area 4;

Thence S 56° 38' 27" W, a distance of 53 feet, more or less, to the thread of the West Branch of the Penobscot River and the town line between the Town of Millinocket and T3 Indian Purchase;

Thence in a general southeasterly and southerly direction, by and along the thread of said river, a distance of 5900 feet, more or less, to the northerly boundary of the Back Channel Wildlife Parcel, so called;

Thence N 76° 51' 44" E by and along said Back Channel Wildlife Parcel boundary, a distance of 2320 feet, more or less, to an angle point in said line;

Thence S 74° 49' 13" E by and along said Back Channel Wildlife Parcel boundary, a distance of 8390 feet, more or less, to the thread of the West Branch of the Penobscot River and the town line between the Town of Millinocket and T3 Indian Purchase; Thence in a general northeasterly direction, by and along the thread of said river, a distance of 4480 feet, more or less, to its intersection with the southerly boundary of Easement Area 7, so called;

Thence N 50° 32' 17" W by and along said Easement Area 7, a distance of 427 feet, more or less, to an angle point in said line; Thence N 54° 48' 17" W by and along said Easement Area 7, a distance of 3245.39 feet to an angle point in said line;

Thence N 35° 11' 55" E by and along said Easement Area 7, a distance of 252.73 feet to an angle point in said line;

Thence N 54° 48' 05" W by and along said Easement Area 7, a distance of 2125.62 feet to the point of beginning. Easement Area "B" contains 1420 acres, more or less.

Bearings referenced in the above descriptions were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

East Millinocket Site

A certain lot or parcel of land with the improvements thereon, situate in the Town of East Millinocket, County of Penobscot, State of Maine, more particularly described as follows:

BEGINNING at an iron rod set at the intersection of the East Millinocket-Medway Town line with the southwesterly line of Bangor & Aroostook Railroad as said railroad is described in a deed recorded in Penobscot County Registry of Deeds, Volume 770, Page 300, which point of intersection is further identified with reference to the Maine State Coordinate System of 1927 (East Zone) as x=483,929.56, y=650,820.53;

thence North 58°18'13" West by and along the line of said Railroad, a distance of 708.31 feet to a point of curve; thence northwesterly by and along the line of said Railroad following a curve to the right with a radius of 1,959.58 feet, an arc distance of 817.85 feet to a point of tangency;

thence North 34°23'16" West by and along the line of said Railroad, a distance of 267.95 feet to a point of curve;

thence northwesterly by and along the line of said Railroad following a curve to the left with a radius of 1,860.58 feet, an arc distance of 698.11 feet to a point of tangency;

thence North 55°53'20" West by and along the line of said Railroad a distance of 672.8 feet to a point of curve;

thence westerly by and along the line of said Railroad following a curve to the left with a radius of 905.87 feet, an arc distance of 415.5 feet to a point of tangency;

thence North 82°10'20" West by and along the lien of said Railroad, a distance of 373.33 feet to a point of curve;

thence by and along the line of said Railroad following a curve to the right with a radius of 1482 18 feet an arc distance of 161.60 feet to a point on the easterly line of the rough -parcel of land described in a deed recorded in Penobscot County Registry of Deeds, Volume 770, Page 300;

thence South 20°38'40" West, by and along the boundary of said fourth parcel, a distance of 50.82 feet to a point;

thence following the southerly boundary of said fourth parcel along a curve to the right with a radius of 1,532.69 feet, an arc distance of 300.00 feet to a point;

thence South 25°30'25" West, by and along the boundary of said fourth parcel, a distance of 44.91 feet to a point;

thence North 50°51'05" West, by and along the boundary of said fourth parcel, a distance of 451.0 feet to a point in the southerly line of the Bangor & Aroostook Railroad main line right of way;

thence North 62°43'20" West by and along the southerly line of said Railroad, a distance of 510.0 feet to a point of curve;

thence by and along the line of said Railroad following a curve to the left with a radius of 1,383.19 feet, an arc distance of 438.52 feet to a point of tangency;

thence North 80°53'25" West by and along the southerly line of said railroad, a distance of 1,435.47 feet to a point of curve; thence by and along the line of said Railroad following a curve to the right with a radius of 1,482.19 feet, an arc distance of 709.41 feet to a point of tangency;

thence North 53°27'49" West by and along the line of said Railroad, a distance of 1,381.88 feet to a point of curve;

thence by and along the line of said Railroad following a curve to the left with a radius of 1,860.58 feet, an arc distance of 431.06 feet to a point of tangency;

thence North 66°44'20" West by and along the line of said Railroad, a distance of 952.98 feet to a point of curve;

thence by and along the line of said Railroad following a curve to the left with a radius of 1,8660.58 feet, an arc distance of 214.42 feet to a point of tangency;

thence North 73°20'35" West, by and along the line of said Railroad, a distance of 565.94 feet to a point of curve;

thence by and along the line of said Railroad following a curve to the right with a radius of 1,959.58 feet, an arc distance of 549.96 feet to a point of compound curvature;

thence by and along the line of said Railroad following a curve to the right with a radius of 2,914.43 feet, an arc distance of 466.57 feet to an iron rod set on a line which is generally parallel with and 240.0 feet easterly from the westerly-most face of the power house building on the northerly end of Dolby Dam, so-called;

thence South 30°00'00" West, by and along said lien which is generally parallel to said building face, a distance of 525.0 feet to a n iron rod set on the northerly bank of the West Branch of the Penobscot River;

thence continuing on the same course, South 30°00'00" West, a distance of 175 feet, more or less, to the thread of the West Branch of the Penobscot River as defined by An Act to incorporate the Town of East Millinocket, Chapter 377, Private and Special Laws of the State of Maine (1907);

thence generally southeasterly by and along the thread of said River as defined by the above-referenced Act, a distance of 13,100 feet, more or less, to its intersection with the East Millinocket-Medway Town line;

thence North 0°15'34" East by and along said town line, a distance of 354 feet, more or less, to an iron rod set in place of a broken wood post found on said town line on the northerly bank of said River; thence continuing the same course, North 0°15'34" East, by and along said town line, a distance of 813.22 feet to the point of beginning. For the sole purpose of providing a geometrically precise description and not to be construed as a boundary of the above described tract, the course and distance between the iron rod set on the northerly bank of the West Branch of Penobscot River on the line which is generally parallel to and 240 feet easterly of the westerly face of the Dolby Dam power house and the iron rod set in place of the broken wood post on the East Millinocket- Medway Town line is South 61°56'27" East, a distance 12,609.00 feet.

Bearings referenced herein are oriented to Grid North, Maine State Coordinate System of 1927, East Zone, as determined by a survey of the within described lot by Plisga & Day, Land Surveyors.

Save And Except The Following East Millinocket Easement Exception Areas (A)-(F)

3.13.4 East Millinocket Easement Exception Areas

3.13.4.1 Easement Exception Area "A" (Wastewater Treatment Facility)

East Millinocket Mill

A certain lot or parcel of land being a portion of the East Millinocket mill site in the Town of East Millinocket, County of Penobscot, State of Maine and being more particularly described as follows: That portion of said East Millinocket Mill Site situated easterly of the following described line:

Beginning at a point on the southerly right of way line of the Bangor and Aroostook Railroad, said point having coordinates N: 713,105.65 feet and E: 966,651.66 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence S 33° 55' 21" W, a distance of 1069 feet, more or less, to a point on the northerly shore of the West Branch of the Penobscot River. Easement Exception Area "A" contains 44 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

3.13.4.2 Easement Exception Area "B" (Area North and East of Training Center) East Millinocket Mill

A certain lot or parcel of land being a portion of the East Millinocket mill site in the Town of East Millinocket, County of Penobscot,

State of Maine and being more particularly described as follows: Beginning at a point easterly of the training center, so called, having coordinates N: 712,895.05 feet and E: 966,396.13 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence N 70° 57' 58" W, a distance of 557.43 feet to a point; Thence S 18° 54' 26" W, a distance of 154.50 feet to a point; Thence S 83° 28' 30" E, a distance of 217.80 feet to a point; Thence S 22° 13' 33" E, a distance of 119.17 feet to a point;

Thence N 72° 30' 29" E, a distance of 330.85 feet to the point of beginning. Easement Exception Area

"B" contains 1.515 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment

3.13.4.3 Easement Exception Area "C" (Area Southwesterly of Training Center) East Millinocket Mill

A certain lot or parcel of land being a portion of the East Millinocket mill site in the Town of East Millinocket, County of Penobscot, State of Maine and being more particularly described as follows:

Beginning at a point northwesterly of the training center, so called, having coordinates N: 712,890.88 feet and E: 965,789.46 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence S 43° 54' 26" W, a distance of 355.01 feet to a point; Thence S 52° 46' 35" E, a distance of 50.14 feet to a point; Thence N 67° 24' 33" E, a distance of 298.48 feet to a point;

Thence N 22° 00' 46" W, a distance of 184.92 feet to the point of beginning. Easement Exception Area "C" contains 0.836 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment

3.13.4.4 Easement Exception Area "D" (Recycle Fiber Plant and Storage Tanks) East Millinocket Mill

Two certain lots or parcels of land being a portion of the East Millinocket mill site in the Town of East Millinocket, County of Penobscot, State of Maine and being more particularly described as follows:

Beginning at a point on the southerly right of way line of the Bangor and Aroostook Railroad, easterly of a crossing located northwesterly of the Recycle Fiber Plant, so called, said point having coordinates N: 714,482.96 feet and E: 963,621.18 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence S 27° 49' 27" E, a distance of 494.42 feet to a point; Thence S 50° 48' 45" E, a distance of 425.47 feet to a point; Thence S 66° 32' 25" E, a distance of 578.56 feet to a point;

Thence N 88° 51' 50" E, a distance of 514.90 feet to a point westerly of the main mill entrance;

Thence N 32° 24' 38" W, running westerly of said entrance, a distance of 282.10 feet to a point;

Thence N 53° 45' 03" W, a distance of 79.58 feet to a point on said Bangor and Aroostook Railroad right of way; Thence S 20° 39' 06" W by and along said right of way, a distance of 50.82 feet to a point;

Thence in a general westerly direction by and along said right of way on a non-tangent curve to the right with a radius of 1532.69 feet an arc distance of 300.13 feet to a point, said curve having a chord bearing N 70° 10' 25" W a chord distance of 299.65 feet; Thence S 25° 30' 51" W by and along said right of way a distance of 44.91 feet to a point;

Thence N 50' 50' 39" W by and along said right of way, a distance of 461.00 feet to a point;

Thence N 62° 42' 55" W by and along said right of way, a distance 510.00 feet to a point of curvature;

Thence in a general westerly direction by and along said right of way on a tangent curve to the left with a radius of 1383.19 feet an arc distance of 280.73 feet to the point of beginning. The above described parcel contains 11.533 acres, more or less.

ALSO another parcel of land being a portion of the East Millinocket mill site in the Town of East Millinocket, County of Penobscot, State of Maine and being more particularly described as follows:

Beginning at a point on the southerly right of way line of the Bangor and Aroostook Railroad, said point having coordinates N: 713,811.26 feet and E: 965,170.45 feet;

Thence S 53° 59' 21" W, a distance of 34.73 feet to a point easterly of the main mill entrance; Thence S 36° 00' 39" E, running easterly of said entrance, a distance of 319.50 feet to a point; Thence N 51° 31' 13" E, a distance of 157.57 feet to a point; Thence N 33° 43' 40" E, a distance of 156.22 feet to a point on said Bangor and Aroostook Railroad right of way;

Thence N 82° 09' 54" W by and along said right of way, a distance of 373.33 feet to the point of beginning. The above described parcel contains 1.304 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

3.13.4.5 Easement Exception Area "E" (Bark Pile)

East Millinocket Mill

A certain lot or parcel of land being a portion of the East Millinocket mill site in the Town of East Millinocket, County of Penobscot, State of Maine and being more particularly described as follows:

Beginning at a point on the southerly side of a road leading from said mill to the Dolby Dam, so called, said point having coordinates N: 714,810.51 feet and E: 961,249.41 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence S 71° 45' 14" E, southerly of said road, a distance of 609.87 feet to a point; Thence S 74° 47' 02" E, southerly of said road, a distance of 492.66 feet to a point; Thence S 88° 24' 01" E, southerly of said road, a distance of 566.64 feet to a point; Thence S 63° 33' 30" E, southerly of said road, a distance of 331.46 feet to a point; Thence S 29° 51' 22" E, a distance of 73.64 feet to a point;

Thence S 19° 57' 30" W, a distance of 811.42 feet to a point; Thence S 10° 05' 41" E, a distance of 218.68 feet to a point; Thence S 42° 58' 36" E, a distance of 236.76 feet to a point;

Thence S 6° 55' 02" W, a distance of 181.02 feet to a point on the northerly shore of the West Branch of the Penobscot River; Thence in a general northwesterly direction, by and along said shoreline, a distance of 2640 feet, more or less, to a point on said shoreline, said point being located N 61° 19' 31" W, a distance of 2320.29 feet from the last described point;

Thence N 13° 15' 42" E, a distance of 786.05 feet to the point of beginning. Easement Exception Area "E" contains 48 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated

MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

3.13.4.5 Easement Exception Area "F" (Near Dolby Dam)

East Millinocket Mill

A certain lot or parcel of land being a portion of the East Millinocket mill site in the Town of East Millinocket, County of Penobscot, State of Maine and being more particularly described as follows: Beginning at an iron rod found on the southerly right of way line of the Bangor and Aroostook Railroad leading from said mill past the Dolby Dam, so called, said point having coordinates N: 717,165.86 feet and E: 957,447.58 feet, said coordinate system is referenced to the Maine State Coordinate System, East Zone, said coordinate system is based on the North American Datum of 1983 (NAD 83);

Thence S 30° 00' 26" W, a distance of 224.00 feet to a point;

Thence S 52° 02' 22" E, running northerly of a road leading from the Mill Site to Dolby Dam, a distance of 253.28 feet to a point; Thence S 33° 39' 28" E, running northerly of said road, a distance of 472.18 feet to a point;

Thence S 60° 15' 46" E, running northerly of said road, a distance of 1352.67 feet to a point;

Thence N 87° 54' 29" E, running northerly of said road, a distance of 426.47 feet to a point westerly of a spur line from said Bangor and Aroostook Railroad;

Thence N 71° 58' 57" E, running westerly of said spur line, a distance of 557.25 feet to a point;

Thence N 4° 16' 32" E, a distance of 102.45 feet to a point on the southerly right of way line of said Bangor and Aroostook Railroad;

Thence N 66° 43' 54" W by and along said right of way, a distance of 952.98 feet to a point of curvature;

Thence by and along said right of way on a tangent curve to the left with a radius of 1860.58 feet, an arc distance of 214.42 feet to a point of tangency;

Thence N 73° 20' 09" W by and along said right of way, a distance of 565.94 feet to a point of curvature;

Thence by and along said right of way on a tangent curve to the right with a radius of 1959.58 feet, an arc distance of 549.96 feet to a point of compound curvature;

Thence by and along said right of way on a curve to the right with a radius of 2914.43 feet, an arc distance of 466.57 feet to the point of beginning. Easement Exception Area "F" contains 27.850 acres, more or less.

Bearings referenced in the above description were computed from a traverse established for a survey of the above-described parcel that was oriented to grid north, Maine State Plane Coordinate System, East Zone, NAD83. Distances referenced herein are grid distances. The connection to the Maine State Plane Coordinate System East Zone, NAD83, is based upon a control monument designated MEDWAY RM 2 which has published coordinates of N: 706,894.72 feet and E: 977,164.59 feet which are based on the 1992 readjustment.

**18. RELEASE OF EASEMENTS**

Also, all of GLHA's right, title and interest in and to the following grants:

a. Deed, Easement Deed and Agreement from John M. Webber, et al., dated December 27, 2001 and recorded in Penobscot County Registry of Deeds in Book 8031, Page 39;

b. Deed, Easement Deed and Agreement from John M. Webber, et al., to Maine Timberlands Company, Great Northern Paper, Inc. and GNE, LLC dated December 27, 2001 and recorded in Piscataquis County Registry of Deeds in Book 1360, Page 79; and

c. Deed, Easement Deed and Agreement from Barbara A. Cassidy, et al., to Maine Timberlands Company, Great Northern Paper, Inc. and GNE, LLC dated December 27, 2001 and recorded in Piscataquis County Registry of Deeds in Book 1360, Page 111.

d. Blanket cross easement deed and agreement from GNP to GNE dated January 31, 2002 and recorded in the Penobscot County Registry of Deeds in Book 8064, Page 241.

**19. APPURTENANT EASEMENT PARCELS**

Appurtenant Drainage Easement (3.10.5 Substation No. 4 Millinocket Mill)

Together with the rights and easements as set forth in an Easement Deed from Our Katahdin to Great Lakes Hydro America, LLC dated March 10, 2020 and recorded in the Penobscot County Registry of Deeds in Book 15467, Page 186.

Appurtenant Drainage Easement (3.14.2 New Substation)

Together with the rights and easements as set forth in an Easement Deed from Katahdin Forest Management, LLC dated March 11, 2020 and recorded in the Penobscot County Registry of Deeds in Book 15468, Page 26.

**20. LEASES ON ISLANDS IN IMPOUNDMENTS OF THE PENOBSCOT MILLS AND RIPOGENUS PROJECTS**

| LEASE | Town Name | Lake Name |
|---|---|---|
| 4035 | Indian Purchase No. 3 | North Twin Lake |
| 4036 | Indian Purchase No. 3 | North Twin Lake |
| 4038 | Indian Purchase No. 3 | North Twin Lake |
| 4039 | Indian Purchase No. 3 | North Twin Lake |
| 4040 | Indian Purchase No. 3 | North Twin Lake |
| 4041 | Indian Purchase No. 3 | North Twin Lake |
| 4042 | Indian Purchase No. 3 | North Twin Lake |
| 4043 | Indian Purchase No. 3 | North Twin Lake |
| 4046 | Indian Purchase No. 3 | North Twin Lake |
| 4047 | Indian Purchase No. 3 | North Twin Lake |
| 4049 | Indian Purchase No. 3 | North Twin Lake |
| 51 | Indian Purchase No. 4 | North Twin Lake |
| 90 | Indian Purchase No. 4 | North Twin Lake |
| 128 | Indian Purchase No. 4 | North Twin Lake |

| LEASE | Town Name | Lake Name |
|---|---|---|
| 172 | Indian Purchase No. 4 | North Twin Lake |
| 179 | Indian Purchase No. 4 | North Twin Lake |
| 454 | Indian Purchase No. 4 | North Twin Lake |
| 789 | Indian Purchase No. 4 | North Twin Lake |
| 798 | Indian Purchase No. 4 | North Twin Lake |
| 962 | Indian Purchase No. 4 | North Twin Lake |
| 1055 | Indian Purchase No. 4 | North Twin Lake |
| 1080 | Indian Purchase No. 4 | North Twin Lake |
| 1140 | Indian Purchase No. 4 | North Twin Lake |
| 1146 | Indian Purchase No. 4 | North Twin Lake |
| 1203 | Indian Purchase No. 4 | North Twin Lake |
| 1232 | Indian Purchase No. 4 | North Twin Lake |
| 1236 | Indian Purchase No. 4 | North Twin Lake |
| 1272 | Indian Purchase No. 4 | North Twin Lake |
| 1275 | Indian Purchase No. 4 | North Twin Lake |
| 1309 | Indian Purchase No. 4 | North Twin Lake |
| 1333 | Indian Purchase No. 4 | North Twin Lake |
| 1341 | Indian Purchase No. 4 | North Twin Lake |
| 1348 | Indian Purchase No. 4 | North Twin Lake |
| 1404 | Indian Purchase No. 4 | North Twin Lake |
| 1414 | Indian Purchase No. 4 | North Twin Lake |
| 1746 | Indian Purchase No. 4 | North Twin Lake |
| 1854 | Indian Purchase No. 4 | North Twin Lake |
| 1987 | Indian Purchase No. 4 | North Twin Lake |
| 1993 | Indian Purchase No. 4 | North Twin Lake |
| 2086 | Indian Purchase No. 4 | North Twin Lake |
| 2113 | Indian Purchase No. 4 | North Twin Lake |
| 2255 | Indian Purchase No. 4 | North Twin Lake |

| LEASE | Town Name | Lake Name |
|---|---|---|
| 2425 | Indian Purchase No. 4 | North Twin Lake |
| 2479 | Indian Purchase No. 4 | North Twin Lake |
| 2780 | Indian Purchase No. 4 | North Twin Lake |
| 2809 | Indian Purchase No. 4 | North Twin Lake |
| 04 | Indian Purchase No. 4 | North Twin Lake |
| 3479 | Indian Purchase No. 4 | North Twin Lake |
| 3566 | Indian Purchase No. 4 | North Twin Lake |
| 3624 | Indian Purchase No. 4 | North Twin Lake |
| 4255 | Indian Purchase No. 4 | North Twin Lake |
| 4733 | Indian Purchase No. 4 | North Twin Lake |
| 4767 | Indian Purchase No. 4 | North Twin Lake |
| 4949 | Indian Purchase No. 4 | North Twin Lake |
| 253 | Indian Purchase No. 4 | South Twin Lake |
| 1346 | Indian Purchase No. 4 | South Twin Lake |
| 1358 | Indian Purchase No. 4 | South Twin Lake |
| 1901 | Indian Purchase No. 4 | South Twin Lake |
| 1915 | Indian Purchase No. 4 | South Twin Lake |
| 2056 | Indian Purchase No. 4 | South Twin Lake |
| 2098 | Indian Purchase No. 4 | South Twin Lake |
| 2233 | Indian Purchase No. 4 | South Twin Lake |
| 2414 | Indian Purchase No. 4 | South Twin Lake |
| 2666 | Indian Purchase No. 4 | South Twin Lake |
| 2910 | Indian Purchase No. 4 | South Twin Lake |
| 2964 | Indian Purchase No. 4 | South Twin Lake |
| 2969 | Indian Purchase No. 4 | South Twin Lake |
| 3543 | Indian Purchase No. 4 | South Twin Lake |
| 3775 | Indian Purchase No. 4 | South Twin Lake |
| 4527 | Indian Purchase No. 4 | South Twin Lake |

| LEASE | Town Name | Lake Name |
|---|---|---|
| 896 | T1 R8 WELS | Millinocket Lake |
| 1793 | T1 R8 WELS | Millinocket Lake |
| 2468 | T1 R8 WELS | Millinocket Lake |
| 2477 | T1 R8 WELS | Millinocket Lake |
| 2729 | T1 R8 WELS | Millinocket Lake |
| 2875 | T1 R8 WELS | Millinocket Lake |
| 582 | T1 R9 WELS | Ambajejus Lake |
| 693 | T1 R9 WELS | Ambajejus Lake |
| 699 | T1 R9 WELS | Ambajejus Lake |
| 729 | T1 R9 WELS | Ambajejus Lake |
| 784 | T1 R9 WELS | Ambajejus Lake |
| 947 | T1 R9 WELS | Ambajejus Lake |
| 1202 | T1 R9 WELS | Ambajejus Lake |
| 1405 | T1 R9 WELS | Ambajejus Lake |
| 1794 | T1 R9 WELS | Ambajejus Lake |
| 1978 | T1 R9 WELS | Ambajejus Lake |
| 2258 | T1 R9 WELS | Ambajejus Lake |
| 2311 | T1 R9 WELS | Ambajejus Lake |
| 2447 | T1 R9 WELS | Ambajejus Lake |
| 2876 | T1 R9 WELS | Ambajejus Lake |
| 3005 | T1 R9 WELS | Ambajejus Lake |
| 3350 | T1 R9 WELS | Ambajejus Lake |
| 3498 | T1 R9 WELS | Ambajejus Lake |
| 3594 | T1 R9 WELS | Ambajejus Lake |
| 3775 | T1 R9 WELS | Ambajejus Lake |
| 4808 | T1 R9 WELS | Ambajejus Lake |
| 1687 | T1 R9 WELS | Millinocket Lake |
| 1767 | T1 R9 WELS | Millinocket Lake |

| LEASE | Town Name | Lake Name |
|---|---|---|
| 3615 | T1 R9 WELS | Pemadumcook Lake |
| 4449 | T1 R9 WELS | Pemadumcook Lake |
| 4868 | T1 R9 WELS | Pemadumcook Lake |
| 3385 | T1 R10 WELS | Pemadumcook Lake |
| 4728 | T2 R13 WELS | Ragged Lake |
| 4772 | T3 R13 WELS S/2 | Caribou Lake |

Schedule B

Mortgage (ME) of Great Lakes Hydro America, LLC

Permitted Exceptions

Those exceptions enumerated on Schedule B of Fidelity National Title Insurance Company Loan Policy No. ME21031756 issued to the Mortgagee other than (i) the exception relating to the Lien for real estate taxes which become due after the date hereof, to the extent the same are not paid by the Mortgagor when due; (ii) any change in the state of facts affecting the Mortgaged Property that would be disclosed by an accurate, current survey from the state of facts disclosed on the surveys described in Exhibit B-1 to said Policy, other than such changes which do not individually or in the aggregate with all other Permitted Liens materially detract from the value of the Mortgaged Property affected thereby or materially interfere with the use of the Mortgaged Property in the ordinary conduct of business; (iii) exception nos. 6, 151b, 166b, 205, 214, 226b, 238, 255 and 264b; and (iv) except to the extent the rights described therein do not materially and adversely affect the use and operation of the Mortgaged Property as currently improved, used, operated and maintained, exception no. 8.



PISCATAQUIS COUNTY
RECORDED
02/01/2022 12:13:01 PM
LINDA M. SMITH
REGISTER OF DEEDS

Brookfield
Renewable U.S.

March 25, 2024

***Via eFiling***

Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Updated Study Report Meeting Notification and Waiver Request**

Dear Acting Secretary Reese:

Great Lakes Hydro America, LLC (GLHA), Licensee of the Ripogenus Hydroelectric Project (No. 2572) and the Penobscot Mills Hydroelectric Project (No. 2458) (collectively referred to as the "Projects"), herein files notification of the dates and location for the upcoming Updated Study Report (USR) Meeting. In addition, GLHA requests a waiver from the applicable portions of 18 CFR §5.15(f) in order to avoid a scheduling conflict for USR Meeting participants.

Consistent with the Federal Energy Regulatory Commission's (FERC) Integrated Licensing Process (ILP), the USR is due to be filed with FERC by April 21, 2024. In accordance with 18 CFR §5.15(f), GLHA is required to hold the USR Meeting within 15 days of the filing of the USR (by May 6, 2024). GLHA has been made aware that the 2024 International Symposium on Ecohydraulics and Fish Passage Conference will be held in Quebec City, Canada from May 5 to 9, 2024. To avoid conflict with the conference, as well as the filing of the Projects' Draft License Application by May 3, 2024, GLHA is proposing to hold the USR Meeting on May 15 and 16, 2024 and subsequently file the USR Meeting Summary by May 31, 2024.

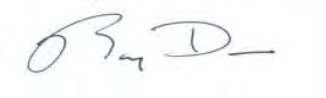
Consistent with the recent Operations Model Workshop hosted by GLHA in support of the relicensing, the USR Meeting will be held in person in Bangor, ME, and an option for virtual participation will be provided. GLHA will communicate the specific meeting location and agenda for the May 15-16, 2024 USR Meeting in the filing of the USR. In order to hold the USR Meeting on May 15 and 16 and file the USR Meeting Summary by May 31, GLHA is requesting a waiver from the applicable portions of 18 CFR §5.15(f).

On March 12, 2024, GLHA notified (via email) interested stakeholders of this information and requested comments be provided by March 20, 2024. One comment was received by Mr. Michael Hudson indicating no issue with the proposed schedule. Copies of this correspondence are enclosed.

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

If you have any questions regarding this letter please contact me by phone at randy.dorman@brookfieldrenewable.com.

Sincerely,



Randall Dorman
Brookfield Renewable

cc: Relicensing Distribution List

Enclosures: Correspondence

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

| | |
|---|---|
| **From:** | Russell, Cate |
| **To:** | Russell, Cate |
| **Cc:** | Scarzello, Michael; Dorman, Randy; Gibson, Jim; Wendy Bley |
| **Bcc:** | Stasulis, Nicholas W; "donald.dow@noaa.gov"; Jeff Murphy - NOAA Federal; Olcott, Dudley (Kyle); Laura Paye (laura.paye@maine.gov); Robert.C.Mohlar@maine.gov; Perry, John - MEDIFW; Obrey, Tim - MEDIFW; lars.hammer@maine.gov; "Clark, Casey"; jimmy@threeriversfun.com; Derek Heady; jeremy@northeastwhitewater.com; matt.polstein@gmail.com; Emily Yearwood; Suzie Hockmeyer; info@raftmre.com; Neal Hagstrom; Heinz, Stephen - ME Trout Unlimited Council; Bob Nasdor \| AW; Mark Zakutansky; Dean@bloomerrussell.com; Kathy Houston; Bill Houston; Michael Hudson; Spear, Ed; McCaw, Dan - Penobscot Indian Nation; charlie.loring.jr@penobscotnation.org |
| **Subject:** | Ripogenus & Penobscot Mills Projects Relicensing - Notice of USR Meeting Date |
| **Date:** | Tuesday, March 12, 2024 12:10:00 PM |

Dear Stakeholder:

Great Lakes Hydro America, LLC (GLHA), Licensee for the Ripogenus and Penobscot Mills Hydroelectric Projects, is contacting you in regards to the timing and location of the upcoming Updated Study Report (USR) Meeting required by 18 CFR 5.15(f) for the FERC Relicensing of the Projects. **Please reply with any comments you have on this information within 7 days of receipt of this email (by March 20, 2024).** Subsequently, GLHA will file this information/request and copies of stakeholder correspondence with the Federal Energy Regulatory Commission (FERC) to obtain approval of the proposed schedule modification described below.

Consistent with FERC's Integrated Licensing Process (ILP), GLHA will be filing the USR by April 21, 2024*. In accordance with 18 CFR § 5.15(f), GLHA is required to hold the USR Meeting within 15 days of the filing of the USR (by May 6, 2024). GLHA has been made aware that the 2024 International Symposium on Ecohydraulics and Fish Passage Conference will be held in Quebec City, Canada from May 5 to 9, 2024, which will be attended by numerous stakeholders and GLHA team members. To avoid conflict with the fish passage conference, as well as the filing of the Projects' Draft License Application by May 3, 2024, GLHA is proposing to hold the USR Meeting on May 15 and 16, 2024 and subsequently file the USR Meeting Summary by May 31, 2024. The USR Meeting will be held in-person in Bangor, ME, and an option for virtual participation will be provided.

Below is a table providing the currently required relicensing schedule and GLHA's proposed schedule modification.

**Please reply with any comments you have on this information within 7 days of receipt of this email (by March 20, 2024).**

Thank you for your interest and participation in the ongoing FERC relicensing of the Ripogenus and Penobscot Mills Projects.

| Item | Currently Required Schedule (per Scoping Document 2) | GLHA Proposed Schedule | Comment |
|---|---|---|---|
| GLHA Files Updated Study Report | By Sunday, April 21, 2024* | By Sunday, April 21, 2024* | GLHA will file Updated Study Report per current schedule (no proposed schedule change). |
| GLHA Files Draft License Application | By Friday, May 3, 2024 | By Friday, May 3, 2024 | GLHA will file Draft License Application per current schedule (no proposed |

| | | | |
|---|---|---|---|
| | | | schedule change). |
| GLHA Conducts Updated Study Report Meeting | Within 15 days of filing USR (by May 6, 2024) | May 15 & 16, 2024 | GLHA proposes to conduct 2-day USR Meeting on May 15 & 16, 2024 to avoid conflict with filing of DLA on May 3 and annual fish passage conference occurring May 5 to 9, 2024. |
| GLHA Files Updated Study Report Meeting Summary | Within 15 days of USR Meeting (by May 22, 2024) | By May 31, 2024 | GLHA proposes to file the Updated Study Report Meeting Summary within 15 days of the proposed USR Meeting date. |

* If a due date falls on a weekend or holiday, the deadline is the following business day.

Cate Russell
*Associate Vice President, Regulatory and Environmental Section Manager*

HDR
75 John Roberts Road, Unit B1
South Portland, ME 04106
**D** 207.239.3792 **M** 617.803.2733
cate.russell@hdrinc.com

hdrinc.com/follow-us

## Russell, Cate

**From:** Michael Hudson <mjhudson655@gmail.com>
**Sent:** Thursday, March 14, 2024 6:55 PM
**To:** Russell, Cate
**Subject:** Re: Ripogenus & Penobscot Mills Projects Relicensing - Notice of USR Meeting Date

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Cate,

This schedule seems fine to me. I plan on attending in person on May 15th and 16th.

Thanks,
Mike Hudson

email: mjhudson655@gmail.com
Member, Caribou and Chesuncook Lake Lot Owners Assoc.

On Tue, Mar 12, 2024 at 12:10 PM Russell, Cate <Cate.Russell@hdrinc.com> wrote:

> Dear Stakeholder:
>
> Great Lakes Hydro America, LLC (GLHA), Licensee for the Ripogenus and Penobscot Mills Hydroelectric Projects, is contacting you in regards to the timing and location of the upcoming Updated Study Report (USR) Meeting required by 18 CFR 5.15(f) for the FERC Relicensing of the Projects. **Please reply with any comments you have on this information within 7 days of receipt of this email (by March 20, 2024).** Subsequently, GLHA will file this information/request and copies of stakeholder correspondence with the Federal Energy Regulatory Commission (FERC) to obtain approval of the proposed schedule modification described below.
>
> Consistent with FERC's Integrated Licensing Process (ILP), GLHA will be filing the USR by April 21, 2024*. In accordance with 18 CFR § 5.15(f), GLHA is required to hold the USR Meeting within 15 days of the filing of the USR (by May 6, 2024). GLHA has been made aware that the 2024 International Symposium on Ecohydraulics and Fish Passage Conference will be held in Quebec City, Canada from May 5 to 9, 2024, which will be attended by numerous stakeholders and GLHA team members. To avoid conflict with the fish passage conference, as well as the filing of the Projects' Draft License Application by May 3, 2024, GLHA is proposing to hold the USR Meeting on May 15 and 16, 2024 and subsequently file the USR Meeting Summary by May 31, 2024. The USR Meeting will be held in-person in Bangor, ME, and an option for virtual participation will be provided.
>
> Below is a table providing the currently required relicensing schedule and GLHA's proposed schedule modification.

**Please reply with any comments you have on this information within 7 days of receipt of this email (by March 20, 2024).**

Thank you for your interest and participation in the ongoing FERC relicensing of the Ripogenus and Penobscot Mills Projects.

| Item | Currently Required Schedule<br><br>(per Scoping Document 2) | GLHA Proposed Schedule | Comment |
|---|---|---|---|
| GLHA Files Updated Study Report | By Sunday, April 21, 2024* | By Sunday, April 21, 2024* | GLHA will file Updated Study Report per current schedule (no proposed schedule change). |
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| GLHA Conducts Updated Study Report Meeting | Within 15 days of filing USR<br><br>(by May 6, 2024) | May 15 & 16, 2024 | GLHA proposes to conduct 2-day USR Meeting on May 15 & 16, 2024 to avoid conflict with filing of DLA on May 3 and annual fish passage conference occurring May 5 to 9, 2024. |
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* If a due date falls on a weekend or holiday, the deadline is the following business day.

Cate Russell

*Associate Vice President, Regulatory and Environmental Section Manager*

HDR

75 John Roberts Road, Unit B1

South Portland, ME 04106

**D** 207.239.3792 **M** 617.803.2733
cate.russell@hdrinc.com

hdrinc.com/follow-us

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

**Federal Agencies**

John Eddins
Archaeologist/Program Analyst
Office of Federal Agency Programs
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

Pamela Mathis
District Manager
Northeastern States
Bureau of Land Management
250 E. Wisconsin Avenue, STE 1100
Milwaukee, WI 53202

Lori A. Ehrlich
Region 1 Administrator
Region 1
Federal Emergency Management Agency
99 High Street, Sixth Floor
Boston, MA 02110

Debbie-Anne A. Reese
Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
19 West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Maine Project Office
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

Leonard Rawlings
FERC Coordinator
Eastern Region
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Joseph Bishop
Water Division Hydro Coordinator
New England Region
U.S. Environmental Protection Agency
5 Post Office Square
Boston, MA 02109

Karen McGuire
New England Region 1
Deputy Regional Administrator
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Kyle Olcott
Hydropower Coordinator
Maine Field Office
U.S. Fish and Wildlife Service
306 Hatchery Road
East Orland, ME 04431

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

**State Agencies**

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Laura Paye
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Erin Wilson
Coastal Policy Specialist
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Peter Jamieson
Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
40 Western Avenue
E.S. Muskie Federal Building, Room 412
Augusta, ME 04330

Stacey Guerin
State Senator
3 State House Station
Augusta, ME 04333

Kathy Irene Javner
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, Maine 04333

Trey Stewart
State Senator
3 State House Station
Augusta, ME 04333

James Lee White
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, ME 04333-0002

**Native American Tribes**

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Rena Newell
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

**Additional Parties**

Dr. Andrew Fisk
Northeast Regional Director
American Rivers
afisk@americanrivers.org

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground
ssindo@chewonki.org

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund
sperry@maine.com

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Jesika Lucarelli
Great Mountain Guide Service
greatmountaings@gmail.com

Mark Nadeau
International Association of Machinists
245 Pamola Park
Millinocket, ME 04462

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Arthur Dickey
Maine Rafting Expeditions
arthurdickey@raftmre.com

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing
mary@mxhmarketing.com

Matt Polstein
New England Outdoor Center
matt.polstein@gmail.com

Jim Murton
North Country Rivers
jim.murton@northcountryrivers.com

Jeremy Hargreaves
Northeast Whitewater
Jeremy@northeastwhitewater.com

Derek Heady
Northeast Whitewater
Derek@northeastwhitewater.com

Michael Smith
Outdoor Sport Institute
176 Highland Ave
Millinocket, ME 04462

Vice President
Penobscot Paddle and Chowder Society
towhee17@gmail.com

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Allison Economy
Representative for Allagash Gateway Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Tom Tyler
President
Sportsman's Alliance of Maine
205 Church Hill Road
Augusta, ME 04330

Jimmy Doria
Three Rivers Whitewater
jimmy@threeriversfun.com

Neil Hagstrom
Trout Unlimited
troutnh@hotmail.com

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,
sharon.klein@maine.edu

Dean Beaupain
dean@bloomerrussell.com

Jeff Fayle
jfayle@gmail.com

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti
granby@cox.net

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris
nsharris@mgh.harvard.edu

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Christopher Howe
funpow89@yahoo.com

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Charles Paone
cpaonejr@gmail.com

Richard Parkes
Rparkesbb3@yahoo.com

Edward Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Robert Van Deventer
bobvnert@gmail.com

Wes Zemrak
2 Brookside Drive
Falmouth, ME 04105

Suzie Hockmeyer
Co-founder
Northern Outdoors, Inc.
1771 US Rt 201
The Forks, ME 04985

Emily Yearwood
Northern Outdoors, Inc.
1771 US Rt 201
The Forks, ME 04985

FEDERAL ENERGY REGULATORY COMMISSION
Washington, DC 20426
April 2, 2024

OFFICE OF ENERGY PROJECTS

Project Nos. 2572-133 and 2458-247 – Maine
Ripogenus Hydroelectric Project
Penobscot Mills Hydroelectric Project
Great Lakes Hydro America, LLC

**VIA FERC Service**

Randall Dorman, Brookfield Renewable
Great Lakes Hydro America, LLC
1024 Central Street
Millinocket, ME 04462

**Reference: Extension of Time to Hold Updated Study Report Meeting and File USR Meeting Summary**

Dear Mr. Dorman:

On March 25, 2024, Great Lakes Hydro America, LLC (GLHA) filed a request to modify the Process Plan and Schedule for relicensing the Ripogenus (P-2572) and Penobscot Mills (P-2458) Projects (collectively, the Projects). The current schedule includes a deadline of April 21, 2024, for filing the Updated Study Report (USR). Based on this USR filing date, the deadline for holding the USR meeting is May 6, 2024.[1] GLHA states that holding the USR meeting during the week of May 6 would conflict with the 2024 *Ecohydraulics and Fish Passage Conference* held in Quebec City, Canada from May 5 to 9, 2024, which multiple USR participants are planning to attend. Therefore, to avoid a scheduling conflict for USR meeting participants, GLHA requests to hold the USR meeting May 15 and 16, 2024.

GLHA's March 25, 2024 filing provides documentation that stakeholders were notified of GLHA's proposal to modify the relicensing schedule. GLHA received no objections to its proposed schedule change. Moreover, GLHA's proposed modification to the schedule would result in no reduction in stakeholder opportunity for review and comment on the USR because the USR would be filed on time by April 21, 2024, and the USR comments would continue to be due on June 21, 2024. The schedule, thereafter, would remain unchanged. Therefore, to accommodate scheduling conflicts for USR

[1] *See* 18 CFR § 5.15(f).

meeting participants, the process plan and schedule for the Projects is modified as follows:

- Deadline for the USR meeting is May 16, 2024.
- Deadline for the USR meeting summary is May 31, 2024.

If you have questions regarding this matter, you may contact Allan Creamer at (202) 502-8365, or allan.creamer@ferc.gov.

Sincerely,

NICHOLAS JAYJACK

Digitally signed by NICHOLAS JAYJACK
Date: 2024.04.02 09:29:48 -04'00'

Nicholas Jayjack
Acting Director
Division of Hydropower Licensing

Debbie Anne Reese
Acting Secretary FERC
888 First Street NE
Washington, D.C. 20426

April 16, 2024

Subject: Comments on P-2572-133 flow modeling requests

Dear Acting Secretary Reese:

I have read the various flow modeling requests submitted by agencies and stakeholders during the past few weeks. I offer the following comments based on my understanding of the elements under review specific to the West Branch Penobscot River downstream from Ripogenus Dam, and a qualitatively similar (though geographically different) circumstance I dealt with as a senior fisheries biologist for more than 30 years.

1. First and foremost I believe the system should be managed to provide the best possible and practical ecological conditions for the aquatic and associated communities affected by "upstream" lake levels and discharges from McKay Station. Robust fish and aquatic communities will benefit a diverse food chain plus an array of water based recreational users as well as lake-shore property owners.

2. In my view the West Branch Penobscot River should not be managed as if it were an industrial conveyance. I believe all aquatic ecologists and biologists would prefer flow regimes that do not experience intra-day fluctuations of 100% or more in contrast to what sometimes, and all too frequently occurs. For example, flow data for July and August 2022 show that on about 2/3 of the days flows from McKay Station increased by 800-1,600 cfs, with attendant flow decreases of similar magnitude. Under these circumstances the aquatic community, particularly macroinvertebrates, was likely altered favoring species tolerant of drastic flow changes.

3.Beyond the absolute magnitude of intra-day flow fluctuations, flow records show that many of these increases and decreases were achieved within 1 hour. These "knife-edge" changes bear little resemblance to natural hydrologic conditions. I recognize this is a regulated system, but such abrupt changes in flow may or may not have been fully anticipated in prior licensing deliberations. In fact, the existing license was based on and issued when stable flows were required for paper making production. Elsewhere for example, sudden flow decreases occurred on the West Branch Delaware River when the so-called Office of the Delaware River Master no longer directed very large releases (primarily from Cannonsville Reservoir) to meet mandated flow targets downstream in the Delaware River at Montague and Trenton, New Jersey. Stranding of aquatic organisms occurred when large releases were abruptly curtailed, public awareness of this was heightened, and eventually the relevant parties acknowledged the need for and adopted ramping rate protocols (see Flexible Flow Management Program at the Delaware River Basin Commission and US Geological Survey

websites listed below). Stable flows would however limit the need for ramping rate protocols to extraordinary circumstances rather than daily occurrences.

4.The Flexible Flow Management Program utilizes data inputs including reservoir storage levels and projected hydrologic conditions to meet multiple objectives, first and foremost being the ability to reliably provide drinking water to millions of people. High quality fishery resources were facilitated by cold water releases from the Delaware system reservoirs, similar to what occurs in the West Branch Penobscot River. Efforts to secure reservoir releases, hence flow regimes, that enhanced habitat and thermal conditions for cold water fishes in the Delaware River system spanned decades. These efforts involved extensive computer modeling and negotiation, and had to balance the diverse needs of the parties to the underlying agreements- no small task. Obviously New York is not Maine; but, from a regulatory (or licensing) perspective multiple and potentially competing interests are involved in the two situations described above. Carefully managed lake levels and relatively stable, robust flow through McKay Station would address the seasonal needs of the whitewater rafting/boating interests, foster improved salmon populations and angling opportunities, protect lake shore property owners, while also supplying electricity to consumers. All of the preceding interests would provide economic benefits locally and more broadly.

5.A number of agencies, organized stakeholder organizations, and individuals forwarded modeling requests focused on more gradual draw-downs of Ripogenus impoundments and constant flows through McKay Station. I am very hopeful that modeling results will point to management recipes that avoid large short-term flow changes, that will be attainable (practical) under “normal” hydrologic conditions, and will be at least acceptable to key interests when hydrologic conditions are less favorable.

Thank you for the opportunity to comment on this important matter.

Philip Hulbert
895 Brickhouse Hill Rd.
East Meredith, NY 13757

Website references to Flexible Flow Management Program

nj.gov/drbc/programs/flow/FFMP_PerformanceRpts.html

usgs.gov/odrm/ffmp/flexible-flow-management-program

**Brookfield**
Renewable U.S.

April 22, 2024

***Via eFiling***

Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Updated Study Report**

Dear Acting Secretary Reese:

Great Lakes Hydro America, LLC (GLHA), the Licensee of the Ripogenus Hydroelectric Project (FERC No. 2572) and the Penobscot Mills Hydroelectric Project (FERC No. 2458) (collectively referred to as the "Projects"), herein files with the Federal Energy Regulatory Commission (FERC) the Updated Study Report (USR) for the relicensing of the Projects. The Projects are located on the West Branch Penobscot River and Millinocket Stream in Piscataquis and Penobscot counties, Maine.

On June 11, 2021, GLHA filed the Notices of Intent (NOIs) and a Pre-Application Document (PAD), which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through FERC's Integrated Licensing Process (ILP). On March 23, 2022, GLHA filed the Revised Study Plan (RSP), and on May 13, 2022, FERC issued the Study Plan Determination (SPD).

Pursuant to the RSP, and as approved and modified by FERC's SPD, GLHA performed study activities in 2022-2023. Available results from the study activities were provided in the Initial Study Report (ISR), which was filed with FERC on April 24, 2023. GLHA performed additional study activities in 2023-2024, for which available results are provided in the enclosed USR pursuant to 18 CFR §5.15(f).

GLHA will conduct a USR Meeting to discuss the available study results. Given the number of studies to be presented during the USR Meeting, the meeting will be held over two days on May 15 and 16, 2024. The meeting will start each day at 9:00 AM and is anticipated to end each day at 5:00 PM. **The meeting will be held *in-person* at the Richard E. Dyke Center for Family Business at Husson University, located at One College Circle in Bangor, Maine 04401**. Although GLHA strongly encourages in-person participation, a virtual option will also be provided.

In order to plan accordingly, GLHA respectfully requests that agencies or stakeholders who plan on attending the meeting to RSVP (indicating either in-person or virtual attendance) by contacting Cate Russell at Cate.Russell@hdrinc.com or by phone at (207) 239-3792 on or before May 8, 2024.

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

The agenda for the USR Meeting is included within the USR and is provided below:

| Date/Time[1] | Meeting Agenda |
|---|---|
| **Wednesday, May 15, 2024** | |
| Morning (9:00 – 12:00) | Welcome, Safety, Purpose of Meeting, Introductions, Relicensing Schedule |
| | Projects Overview |
| | Operations Model Study Update (model run results to be provided at a later date) |
| | USGS Gage Feasibility Study |
| | Water Quality Study (Riverine Water Temperature and Dissolved Oxygen Study, Benthic Macroinvertebrate Assessment) |
| 12:00 – 1:00 | Lunch break (on your own) |
| Afternoon (1:00 – 5:00) | Angler Flow Evaluation Study in West Branch Downstream of Stone Dam |
| | North Twin Impoundment Tributary Access Survey |
| | Upstream Eel Passage Assessment Study |
| | Recreation Study |
| | Whitewater Boating Assessment Study |
| **Thursday, May 16, 2024** | |
| Morning (9:00 – 12:00) | Welcome, Safety, Purpose of Meeting, Introductions, Relicensing Schedule |
| | Projects Overview |
| | Aesthetics Study |
| | Terrestrial, Wildlife, and Botanical Resources Study |
| | Riparian and Littoral Habitat Assessment Study |
| | Marsh Bird Survey Study |
| 12:00 – 1:00 | Lunch break (on your own) |
| Afternoon (1:00 – 5:00) | Umbazooksus Lake Mitigation Evaluation Study |
| | Furbearer Survey Study |
| | Wood Turtle Habitat and Presence Study |
| | Environmental Justice Study |

1. GLHA anticipates presenting the studies consistent with times identified in the agenda; however, the agenda should be used as a general guide. Based on the duration of the study presentations, the schedule may be modified (e.g., a select number of studies planned for the afternoon may be presented prior to the scheduled lunch break). GLHA encourages stakeholders to participate for the entirety of the meeting or given day in order to not miss a study of interest.

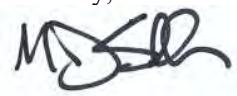
Concurrent with this filing, GLHA is providing a copy of this letter to all parties listed in the attached distribution list. Parties can download an electric copy of the public portions of the USR from FERC's eLibrary system at https://www.ferc.gov/ferc-online/elibrary by conducting a search using the docket numbers P-2458 and/or P-2572.

Considering that the USR provides a detailed description of the overall progress of the required studies, a separate Study Progress Report will not be filed on May 1, 2024, as the information would be duplicative of this filing. Pursuant to the ILP schedule, GLHA will file the next Study Progress Report with FERC on or about August 1, 2024.

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

If you have any questions regarding this letter, the USR, or the USR Meeting, please contact me by phone at (315) 566-0197 or by email at michael.scarzello@brookfieldrenewable.com.

Sincerely,



Michael Scarzello
Manager, Licensing
Brookfield Renewable U.S.

cc: Relicensing Distribution List

Enclosed: Updated Study Report

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Distribution List

**Federal Agencies**

Rachael Mangum, MA, RPA
Assistant Director
Federal Permitting, Licensing, and Assistance Section
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001

Pamela Mathis
District Manager
Northeastern States
Bureau of Land Management
250 E. Wisconsin Avenue, STE 1100
Milwaukee, WI 53202

Lori A. Ehrlich
Region 1 Administrator
Region 1
Federal Emergency Management Agency
99 High Street, Sixth Floor
Boston, MA 02110

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Debbie-Anne A. Reese
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
19 West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Maine Project Office
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

Leonard Rawlings
FERC Coordinator
Eastern Region
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Joseph Bishop
Water Division Hydro Coordinator
New England Region
U.S. Environmental Protection Agency
5 Post Office Square
Boston, MA 02109

Karen McGuire
New England Region 1
Deputy Regional Administrator
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Kyle Olcott
Hydropower Coordinator
Maine Field Office
U.S. Fish and Wildlife Service
306 Hatchery Road
East Orland, ME 04431

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

**State Agencies**

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Laura Paye
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Erin Wilson
Coastal Policy Specialist
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Peter Jamieson
Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
40 Western Avenue
E.S. Muskie Federal Building, Room 412
Augusta, ME 04330

Stacey Guerin
State Senator
3 State House Station
Augusta, ME 04333

Kathy Irene Javner
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, Maine 04333

Trey Stewart
State Senator
3 State House Station
Augusta, ME 04333

James Lee White
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, ME 04333-0002

**Native American Tribes**

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Rena Newell
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

**Additional Parties**

Dr. Andrew Fisk
Northeast Regional Director
American Rivers

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Jesika Lucarelli
Great Mountain Guide Service

Mark Nadeau
International Association of Machinists
245 Pamola Park
Millinocket, ME 04462

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Arthur Dickey
Maine Rafting Expeditions

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing

Matt Polstein
New England Outdoor Center

Jim Murton
North Country Rivers

Jeremy Hargreaves
Northeast Whitewater

Derek Heady
Northeast Whitewater

Suzie Hockmeyer
Co-founder
Northern Outdoors, Inc.
1771 US Rt 201
The Forks, ME 04985

Emily Yearwood
Northern Outdoors, Inc.
1771 US Rt 201
The Forks, ME 04985

Michael Smith
Outdoor Sport Institute
176 Highland Ave
Millinocket, ME 04462

Kenny DeCoster
Vice President
Penobscot Paddle and Chowder Society

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Allison Economy
Representative for Allagash Gateway Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Tom Tyler
President
Sportsman's Alliance of Maine
205 Church Hill Road
Augusta, ME 04330

Jimmy Doria
Three Rivers Whitewater

Neil Hagstrom
Trout Unlimited

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,

Dean Beaupain

Jeff Fayle

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Christopher Howe

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Charles Paone

Richard Parkes

Edward Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Robert Van Deventer

Debbie-Anne Reese, Secretary May 1, 2024
Federal Energy Regulatory Commission
888 First Street, N.E., Room 1A
Washington, DC 20426 RE

**Subject:** Ripogenus Project (P-2572) Comments and Study Suggestions on the Proposed Ramping Study Plan Issued Via Email on April 24, 2024.

Dear Secretary Reese: Via Electronic Filing

The proposed Ramping Study Plan (RSP) sent by Jessie Wechsler in an April 24, 2024, was recently forwarded to me as I was not on the distribution list. Based on my 25 plus years of on-site experience as then Great Northen Papers (GNP) fisheries biologist, I am offering comments and suggestions.

First and foremost, the 1991 FERC License Application clearly states that Alevin (salmon fry as they leave from the egg pit) emerge from the redd sometime between June 5 and June 10th. These 25 mm "fry" are extremely vulnerable to flow changes. I find it incredibly reckless to propose a flow study that is designed to protect salmonid resources during the early weeks of fry growth and dispersal.

Errata: The Licensee continues to misrepresent critical facts. There is NO Landlock salmon (salmon) spawning in streams tributary to the West Branch of the Penobscot below McKay Station. In fact, only Nesowadenhunk Stream was a candidate stream during GNP 1980s studies, and while salmon routinely sought "summer" refuge in the stream's outflow, no signs of salmon spawning were observed in several searches.

Additionally, the RSP referenced that a "one hourly flow change of greater than 25% occurred only 14.9% of the time between 2014 and 2022." While probably true, the statement is misleading. The analysis included hydraulic condition e.g., reduced storage, spill events where any shift of flow would have either been impractical or impossible. Low impoundment elevations, subsequent low flow conditions, and spill events are not relevant to the present study plan and ramping issues.

Lastly, I disagree that "operations data filed with the ISR meeting summary" show that typical operation consists of a two unit mode. Previously provided figures and tables simply refute that statement.

As presented, the RSP lacks the timing, sampling sites and collection methods needed to provide FERC staff with a robust data set.

Timing: June sampling is during both the peak of fish and aquatic communities activity as well as angler activity. As noted above, newly emerged salmonid fry are vulnerable to flow change. Thus, the risk is not only to the aquatic environment, but each event is likely to disrupt several days of angler activity ( boating is also a consideration). During the historic GNP July 4th and Labor Day mill "shutdowns" it took several days for "fishing" to return to "normal". While the proposed ramping study is shorter in duration, why risk the loss of 200 angler days of what was historically (there is no current creel survey information available), quality fishing?

Therefore, I suggest late September or early October as a RSP study window of opportunity. I say this knowing that such a delay will grant the Licensee further delay in the issuance of a new license. However, aquatic resources must be a priority.

The RSP is silent on the starting time of flow shifts. For reasons explained below, I suggest that trial flows begin mid-morning after peak insect drift and end late afternoon before peak insect drift.

Aquatic insects provide critical forage for juvenile salmon and as maintenance food items to adult salmon during summer periods. The RSP addresses aquatic communities only in terms of mortalities. They then continue by quoting Smokorowski et al (2011) implying that they are familiar with work done by Smokorowki, Marty and others on the Magpie and Batchawana Rivers. Impressive work, sponsored by the Licensee.

The Licensee correctly identified Smokorowski and other's work but failed to include their reports of increased aquatic communities "drift" and population shifts resulting from unramped peaking. The literature is replete with publications concerning aquatic insect drift (or movement) caused by peaking as well as emergency outages. This phenomenon should be addressed in the RSP. My filing of February 14, 2022 (accession No. -20220214-5027) provided details of impacts resulting from unramped peaking and regulated flows and

an accompanying list of peer reviewed references. I see no need to repeat well-known science.

I suggest the RSP be modified and include aquatic community drift before, during, and after flow changes. For all sample sites, duplicate metered(,) drift nets should be set in a fixed position for two hour periods just prior to flow increases; emptied and set again immediately as flow rises; removed before a flow change, and then reset for a two hour period after flows are increased. As mentioned above, to avoid bias caused by the sometimes -crepuscular/diel aquatic insect behavior, sampling should be mid-day.

As designed, the RSP includes only about 10 percent of critical salmonid spawning areas (Vol IX 1991 Ripogenus Project Application Table 16) and perhaps a third of salmonid nursey and aquatic insect habitat. This oversight can easily be corrected by including the two flow sensitive areas (either the gravel bar above Line Pool or the relatively long gravel area beginning at the end of Line Pool ) immediately above Nesowadenhunk Deadwater“ and removing the “below Big Eddy Site”. This minor change will include the “Horserace”, prime nursery habitat, and the major spawning areas, Little A Deadwater and the two combined “head of Nesowadenhunk Deadwater” sites. The third major spawning area is the pool immediately below Abol Bridge and is downstream of the reaches of apparent study interest although it is thought to be critical to the North Twin Impoundment salmon population.

Please ensure that the 2024 year class of salmon receives the needed flow protection and that the impact of sudden flow change on aquatic insects is considered. Thank you for the opportunity to comment and offer suggestions based on my 25 years of experience as the onsite-fisheries biologist.

Ed Spear

307 Mt Hope Ave
Bangor, Me 04401
Email: edspear1@yahoo.com
Phone: 207-217-4288

Brookfield
Renewable U.S.

May 3, 2024

***Via eFiling***

Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Draft License Application**

Dear Acting Secretary Reese:

Great Lakes Hydro America, LLC (GLHA), the Licensee of the Ripogenus Hydroelectric Project (FERC No. 2572) and the Penobscot Mills Hydroelectric Project (FERC No. 2458) (collectively referred to as the "Projects"), herein files with the Federal Energy Regulatory Commission ("FERC" or "Commission") the Draft License Application (DLA) for the relicensing of the Projects. The Projects are located on the West Branch Penobscot River and Millinocket Stream in Piscataquis and Penobscot counties, Maine.

Each Project's current FERC license was issued on October 22, 1996, and expires on September 30, 2026. On June 11, 2021, GLHA filed the Notices of Intent and a Pre-Application Document, which initiated the formal relicensing proceeding using FERC's Integrated Licensing Process to obtain two separate new licenses for the continued operation of the Projects.

In accordance with 18 Code of Federal Regulations (CFR) §5.16, GLHA is herein filing the DLA with FERC for the Projects. Pursuant to 18 CFR §5.16(e), stakeholders may file comments with FERC on the DLA within 90 days of the DLA filing date (by August 1, 2024).

Concurrent with this filing, GLHA is providing a copy of this letter to all parties listed in the attached distribution list. Parties can download an electric copy of the public portions of the DLA from FERC's eLibrary system at https://www.ferc.gov/ferc-online/elibrary by conducting a search using the docket numbers P-2458 and/or P-2572.

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

If you have any questions regarding this letter or the DLA, please contact me by phone at (315) 566-0197 or by email at michael.scarzello@brookfieldrenewable.com.

Sincerely,



Michael Scarzello
Manager, Licensing
Brookfield Renewable U.S.

cc: Relicensing Distribution List

Enclosed: Draft License Application

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Pre-Application Document
Distribution List

**Federal Agencies**

Rachael Mangum, MA, RPA
Assistant Director
Federal Permitting, Licensing, and Assistance Section
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001

Glori James-Suarez
Realty Specialist
Northeastern States
Bureau of Land Management
250 E. Wisconsin Avenue, STE 1100
Milwaukee, WI 53202

Lori A. Ehrlich
Region 1 Administrator
Region 1
Federal Emergency Management Agency
99 High Street, Sixth Floor
Boston, MA 02110

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Debbie-Anne A. Reese
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
19 West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Pre-Application Document
Distribution List

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Maine Project Office
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

Leonard Rawlings
FERC Coordinator
Eastern Region
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Joseph Bishop
Water Division Hydro Coordinator
New England Region
U.S. Environmental Protection Agency
5 Post Office Square
Boston, MA 02109

Karen McGuire
New England Region 1
Deputy Regional Administrator
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Kyle Olcott
Hydropower Coordinator
Maine Field Office
U.S. Fish and Wildlife Service
306 Hatchery Road
East Orland, ME 04431

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

**State Agencies**

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Laura Paye
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Erin Wilson
Coastal Policy Specialist
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Peter Jamieson
Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
40 Western Avenue
E.S. Muskie Federal Building, Room 412
Augusta, ME 04330

Stacey Guerin
State Senator
3 State House Station
Augusta, ME 04333

Kathy Irene Javner
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, Maine 04333

Trey Stewart
State Senator
3 State House Station
Augusta, ME 04333

James Lee White
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, ME 04333-0002

**Native American Tribes**

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Rena Newell
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

**Additional Parties**

Dr. Andrew Fisk
Northeast Regional Director
American Rivers

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Jesika Lucarelli
Great Mountain Guide Service

Mark Nadeau
International Association of Machinists
245 Pamola Park
Millinocket, ME 04462

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Arthur Dickey
Maine Rafting Expeditions

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing

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New England Outdoor Center

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North Country Rivers

Jeremy Hargreaves
Northeast Whitewater

Derek Heady
Northeast Whitewater

Suzie Hockmeyer
Co-founder
Northern Outdoors, Inc.
1771 US Rt 201
The Forks, ME 04985

Emily Yearwood
Northern Outdoors, Inc.
1771 US Rt 201
The Forks, ME 04985

Michael Smith
Outdoor Sport Institute
176 Highland Ave
Millinocket, ME 04462

Kenny DeCoster
Vice President
Penobscot Paddle and Chowder Society

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Amanda Williams
Representative for Allagash Gateway Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Pre-Application Document
Distribution List

Tom Tyler
President
Sportsman's Alliance of Maine
205 Church Hill Road
Augusta, ME 04330

Jimmy Doria
Three Rivers Whitewater

Neil Hagstrom
Trout Unlimited

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,

Dean Beaupain

Jeff Fayle

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Christopher Howe

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Charles Paone

Richard Parkes

Edward Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Robert Van Deventer

Brookfield
Renewable U.S.

May 3, 2024

***Via eFiling***

Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Response to Stakeholder-Requested Alternative Operating Scenarios**

Dear Acting Secretary Reese:

Great Lakes Hydro America, LLC (GLHA), Licensee of the Ripogenus Hydroelectric Project (No. 2572) and the Penobscot Mills Hydroelectric Project (No. 2458) (collectively referred to as the "Projects"), herein provides responses to the alternative operating scenarios requested by stakeholders to be evaluated using the operations model developed for the Projects.

**Background**

On June 11, 2021, GLHA filed the Notices of Intent and a Pre-Application Document (PAD), which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through FERC's Integrated Licensing Process (ILP). On March 23, 2022, GLHA filed the Revised Study Plan (RSP), and on May 13, 2022, FERC issued the Study Plan Determination (SPD). Pursuant to the RSP and as approved and modified by FERC's SPD, GLHA performed first season study activities in 2022 with available results provided in the Initial Study Report (ISR) filed with FERC on April 24, 2023. Subsequent to filing the ISR, stakeholders filed comments on the ISR and new study requests, and on September 19, 2023, FERC issued the second SPD.

Pursuant to the RSP and FERC-issued SPDs, GLHA developed an operations model designed to evaluate alternative operating scenarios in support of the ongoing relicensing of the Projects. During the May 2, 2023, ISR Meeting, GLHA described how the operations model was developed, calibrated, and verified. Building off the information presented during the ISR Meeting, GLHA hosted a 2-day workshop on January 31 and February 1, 2024, to further explain the model inputs, calibration, and verification as well as the process for requesting alternative operating scenarios to potentially be evaluated using the operations model. On February 5, 2024, GLHA filed with FERC a copy of the information presented and discussed during the workshop and requested that stakeholders submit their alternative operating scenario requests by March 6, 2024.

**Alternative Operating Scenario Requests**

Stakeholders filed requests for alternative operating scenarios to be evaluated using the operations model – resulting in a total of 36 unique model run requests. GLHA reviewed the stakeholder requests and herein provides a summary of the requested alternative operating scenarios, a summary of the scenarios that will be evaluated

GREAT LAKES HYDRO AMERICA, LLC
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

using the operations model, and GLHA's assumptions (where applicable) related to model coding associated with the requested scenarios.

As discussed with stakeholders during the Operations Model Workshop, the operations model and its use for evaluating alternative operating scenarios at this time is to weigh the ***relative*** impact or sensitivity and response of the system to modified operating scenarios. In other words, use of the operations model tool at this time is to identify the "book ends" of the system (i.e., operations that are feasible or not feasible based on water availability) in support of identifying the operating scenario to be implemented during the new license term.

As presented in the attachment, GLHA has identified 15 of the 36 requested scenarios to be evaluated through the operations model. Based on a review of the requested scenarios, GLHA determined that certain scenarios were either too similar and would not provide discernible differences in results or were considered inconsistent with the basic design of the store-and-release system and its established water use goals. Additionally, the requested scenarios specific to providing flows from Ripogenus Dam and Stone Dam would primarily be limited to a reduction in power generation and are expected to have little impact on the water availability in the system; therefore, GLHA does not believe that evaluating these requested scenarios via the operations model will provide informative model results. In lieu of performing model runs limited to generation impacts, the impacts associated with the various requested flow scenarios downstream of the Ripogenus and Stone dams can be determined via a simplified calculation.

**Information Related to Vertical Datum**

In his letter dated March 13, 2024, Mr. Ben Worrell of Rudman Winchell indicated that historical records note the normal full pond elevation at the Ripogenus impoundment should be 944 feet; however, Mr. Worrell does not indicate the vertical datum associated with this information.

By way of background, impoundment elevation is based on vertical datum for which there are various sources of vertical datum that determine elevation. Per a review of historical records in relation to vertical datums, GLHA determined that the elevations referenced in the historical records noted in Mr. Worrell's letter were in relation to Great North Paper Company (GNP)-established (local) vertical datum. However, elevations associated with Project facilities as noted in the existing FERC license and other Project-related documents filed with FERC are in relation to National Geodetic Vertical Datum of 1929 (NGVD 29), which is often referenced as "USGS Datum," because it refers to the datum used by the U.S. Geological Survey at that time. Enclosed is a table that provides the conversion of GNP vertical datum to USGS vertical datum (defined as NGVD 1929). Based on this information, the normal full pond elevation at the Ripogenus impoundment is and has been elevation 941.59 feet NGVD 29, which is equivalent to elevation 944 feet GNP. Therefore, GLHA disagrees with the assertions made by Mr. Worrell in his March 13, 2024, letter regarding the historical normal full pond elevation.

**Information Related to Normal Full Pond Elevation**

Numerous stakeholders requested alternative operating scenarios that would fill and maintain the Ripogenus impoundment elevation at or above 941.59 feet NGVD 29. Although normal full pond elevation at Ripogenus impoundment is defined as 941.59 feet NGVD 29, GLHA targets an operating full pond elevation of 939.00 feet to allow sufficient freeboard to avoid spill events and to limit the potential for downstream flooding and the activation of the Project's Emergency Action Plan. Therefore, for modeling purposes, GLHA will continue to use 939.00 feet as the target full pond elevation of the impoundment.

**Schedule for Operations Model Run Results**

GLHA will perform the operation model runs for the identified alternative operating scenarios, as further described in the enclosed information. GLHA anticipates completion of the model runs in June 2024 with results filed with FERC by June 28, 2024. Subsequent to filing model run results with FERC, GLHA will coordinate a virtual meeting with interested stakeholders to review the model run results.

Concurrent with this filing, GLHA is providing a copy of this letter to all parties listed in the enclosed distribution list. Parties can download an electric copy of this filing from FERC's eLibrary system at https://www.ferc.gov/ferc-online/elibrary by conducting a search using the docket numbers P-2458 and/or P-2572.

If you have any questions regarding this information, please contact me by email at michael.scarzello@brookfieldrenewable.com.

Sincerely,



Michael Scarzello, Licensing Manager
Brookfield Renewable U.S.

cc: Relicensing Distribution List

Enclosures: Summary of Requested Alternative Operating Scenarios
Comparison of GNP and USGS/NGVD 29 Vertical Datum

Brookfield
Renewable U.S.

May 3, 2024

***Via eFiling***

Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Supplement to Updated Study Report**

Dear Acting Secretary Reese:

On April 22, 2024, Great Lakes Hydro America, LLC (GLHA), Licensee of the Ripogenus Hydroelectric Project (No. 2572) and the Penobscot Mills Hydroelectric Project (No. 2458) (collectively referred to as the "Projects"), filed the Updated Study Report (USR) for the Projects[1]. In support of the ongoing relicensing process, GLHA is filing this supplement to the April 22nd filing.

In the Federal Energy Regulatory Commission's ("FERC" or "Commission") September 19, 2023, second Study Plan Determination (SPD)[2], FERC included the following language regarding a new McKay Station Fish Stranding Mitigation Study.

> The first study season findings of the Fish Stranding Study highlight the potential need to mitigate the fish and invertebrate stranding and mortality described above [section 5.15(e)(2)]. Therefore, we recommend that GLHA conduct a second study season McKay Station Fish Stranding Mitigation Study to identify and assess measures to minimize the level of fish and macroinvertebrate stranding and mortality that occurs when McKay Station trips offline. GLHA would consult with the U.S. Fish and Wildlife Service (FWS), Maine DIFW, and Maine TU to determine: (1) what effect the unplanned outages at McKay Station have on the fish and macroinvertebrate populations in the West Branch downstream from McKay Station; and (2) if appropriate, identify potential ways to address fish and macroinvertebrate stranding and mortality downstream from McKay Station. The results of this effort would be added to the first season findings in a final Fish Stranding Study Report provided with the Updated Study Report (USR).

For the reasons outlined below, GLHA proposes to complete the McKay Station Fish Stranding Mitigation Study in conjunction with the McKay Station Ramping Study. Upon completion of the study, GLHA will file the results of the McKay Station Fish Stranding Mitigation Study as an attachment to the McKay Station Ramping Study Report, which as indicated in Table 4-1 of the USR, is ongoing and the report will be filed as a supplement to the USR upon completion.

[1] Accession Number: 20240422-5168
[2] Accession Number: 20230919-3046

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

- Consistent with the Commission's September 19, 2023 SPD, GLHA will be performing the McKay Station Ramping Study in consultation with Trout Unlimited (TU) and Maine DIFW. Given that the McKay Station Fish Stranding Mitigation Study requires GLHA to consult with FWS, Maine DIFW, and TU to determine what effect the unplanned outages at McKay Station have on the fish and macroinvertebrate populations in the West Branch downstream from McKay Station, GLHA believes that the results of the 2024 McKay Station Ramping Study are necessary to support this phase of the study. In addition, GLHA believes that completion of the McKay Station Ramping Study is necessary to better understand the effects that require mitigation and is a necessary precursor to performing additional evaluation of potential mitigation measures. GLHA will combine the results of the 2024 McKay Station Ramping Study with the information obtained to date in support of this process.
- GLHA understands that that potential mitigation measures associated with unplanned outages at McKay Station is a topic being considered by both FERC's Division of Hydropower Administration and Compliance (DHAC) and Division of Hydropower Licensing (DHL). Whereas DHAC is interested in potential near term measures (i.e., under the Project's existing license), DHL's interests are focused on measures that may be appropriate to include in the Project's new license. GLHA's January 19, 2024 filing[3] provides a summary of the consultation activities performed to date in response to DHAC's August 22, 2023 correspondence[4].
- Infrequent, unplanned outages at McKay Station are not a new issue and, to the contrary, were carefully considered prior to and during the previous relicensing. Many of the environmental measures currently in place at the Project were specifically developed to mitigate the potential effects of Project operations, including sudden changes in water levels due to unplanned outages. Some of these in-place protective measures, such as the automated minimum flows from McKay Station, were established to support downstream aquatic populations that may be impacted by Project operations. But one key mitigation measure not so obviously related to this issue is the Holbrook side channel. During the previous relicensing, the development and operation of the Holbrook side channel was the subject of a Section 10(j) recommendation made by the Department of Interior and was required by Article 406 of the Project's existing license. FERC and the relicensing parties at the time identified the Holbrook side channel as the appropriate mitigation measure to address variable flows from McKay Station. The benefits of this mitigation measure were validated by GLHA's 2022 *Fish Stranding Study,* which demonstrated that changes in river flow during an unplanned outage do not affect water levels in the Holbrook Side Channel, and no stranding of fish or macroinvertebrates was observed. GLHA believes that the Holbrook side channel currently provides effective mitigation for this issue and should be central to any decisions regarding potential future mitigation measures related to planned and unplanned flows from McKay Station.

GLHA looks forward to discussing the study at the USR Meeting. In addition, GLHA looks forward to completing the McKay Station Fish Stranding Mitigation Study and will file the results of the study as an attachment to McKay Station Ramping Study upon completion.

[3] Accession Number: 20240119-5146
[4] Accession Number: 20230822-3052

If you have any questions regarding this filing, please contact me by email at michael.scarzello@brookfieldrenewable.com.

Sincerely,



Michael Scarzello, Licensing Manager
Brookfield Renewable U.S.

cc: Relicensing Distribution List

Debbie-Anne A. Reese, Secretary May 8, 2024
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject: Ripogenus Hydroelectric Project (FERC No. 2572-133) Comments on Great Lakes Hydro America May 3, 2024, Response to Stakeholder-Requested Alternative Operating Scenarios**

Dear Secretary Reese: Via Electronic Filing

The Great Lake Hydro America (Licensee) filing of May 3, 2024, stated which of the stakeholder and agency requested model runs would be simulated. This was extremely disappointing as it substitutes Licensee's goals in place of historic operations. In doing so the Licensee uses indefensible parameters that will force the model to produce results favorable to hydroelectric generation and future Licensee requirements. Should the Licensee be allowed to "run" the Operations Model as stated in the May 3, 2024, filing; non-power values, fish and aquatic resources will be purposely excluded.

Two unsupported comments in the Licensee's filing which impact fish, aquatic communities, angling opportunity and (probably) boating goals are alarming. The Licensee continues to use 939 ft as the Ripogenus Impoundment full pond operating elevation and states that McKay Station outflows of 1400-1600 cfs are impossible.

If allowed to use its own arbitrarily created parameters, model runs results will be meaningless. FERC staff will have only biased information

that considers power needs to construct a 30-year license. This will eliminate any chance of balancing the uses of the resource.

The Licensee states "*GLHA targets an operating full pond elevation of 939.00 feet*
*to allow sufficient freeboard to avoid spill events and to limit the potential for downstream flooding….*" The Phrase "an operating full pond elevation" is simply another wording for the Impoundment will only be filled to an elevation of 941.6 (or 944 ft) for three to four weeks a year. No change in operations; just different wording. In effect, the Licensee proposal(,) is a 2.6-foot reduction in the Ripogenus Impoundment elevation. This allows the Licensee to hide from regulation, 3 billion cubic feet of water. I worked closely with the Great Northen Paper hydro system for 25 years. Possible maximum flood(s) was never an issue. Ripogenus Dam and the remote woodlands downstream were not as risk should such an event occur. If the Licensee has a peer-reviewed study that demonstrates dam safety issues they should make this available to the agencies, stakeholders, and FERC staff.

The reduction in allowable Ripogenus Dam elevation and storage makes little sense. It is impossible to imagine a mark-driven hydroelectric operator giving up 3 BCF of useable storage. Not only will environmental and recreational guilds lose storage and resultant flow; the loss generation will be felt in stockholder's value. The operational shift to a 939 ft Ripogenus Impoundment as a full elevation is not credible.

The Maine Department of Inland Fisheries and Wildlife and the US Fish and Wildlife Service requested model runs where base flows increased in 200 cfs increments. The Licensee responded that *Based on turbine unit limitations, flows of 1400 and 1600 cfs are not feasible from McKay Station".* Based on Appendix A: Operations Model Study - Operations Model Logic and Validation Report, Figures 5. 42-44, that statement is incorrect. While flows of 1400 or 1600 cfs may be operationally undesirable due to reduced turbine efficiencies, no information is provided as why such flows cannot be produced to meet environmental objectives.

The conglomeration of statements made by Licensee initially involved in developing an operational model were that the modeling output would be based on historic information e.g. storage, inflow. Historic data has been massaged to fit future operation goals. Rather than using data over the last 10 (2014-2023) or 20 (2005-2023) time period, the Licensee preemptively interjected its own Ripogenus Project water management scheme.

In the 1996 Environmental Impact Statement, that was based on the GNP Water Use Plan, FERC staff concluded that Ripogenus and North Twin Projects (P-2458) storage were capable of meeting all elevation and flow goals other than Backchannel (P-2458) flows in "dry years". The use of project storage to support market driven peaking operations was obviously not considered. Peaking flows, turbine efficiency and the avoidance of spillage should not be parameters used in initial modeling runs.

In my initial (October 9, 2021) and subsequent filings, I requested an independent peer-reviewed water management plan. The Licensee's May 3, 2024, and earlier filings are an endorsement of my requests. The development of an Operational Model and its iterations are not the time or place for the Licensee to impose its goals, backed up by questionable assumptions. The agencies, stakeholders and FERC staff need unbiased model results as a starting point when making reasonable requests designed to protect environmental and recreational goals.

As requested in earlier filings, I repeat my request for an independent peer review water management analysis.

Thank you for the opportunity to comment and make suggestions.

Ed Spear

307 Mt Hope Ave.
Bangor, Me 04401
Email: edspear1@Yahoo.com
Phone: 207-217-4288

Debbie-Anne A. Reese, Secretary May 9, 2024
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

RE. Penobscot Mills Project (P-2458). Comments on the North Twin Tributary Access Study Report Appendix E-7 of the Final Study Report

Dear Secretary Reese: Via Electronic Filing

In their initial Penobscot Mills Project (P-2458) Pre-Application Document comments, Maine Department of Fisheries and Wildlife('s) (MeDIFW) requested a survey of North Twin impoundment landlocked salmon (salmon) tributaries. The final study plan goal was description of barriers that might block or hinder adult salmon pre spawning movement into tributaries at various impoundment elevations. This request duplicated studies conducted as part of the 1991 FERC licensing event. However, in order to determine if there was subtle, physical impedance, MeDIFW requested that (adult) salmon be radio tagged and tracked. Radio tagging would track delays in upstream movement and possible shoreline spawning activity.

The North Twin Tributary Access study report (Appendix E-7) filed as part of the Final Study Report represents a great deal of effort and ingenuity as well as some outstanding graphics. Largely as the result of the failure to include MeDIFW's radio telemetry request, study results produced new questions and NO answers. Additionally, this report contains substantial errors and misleading statements.

Rainbow Lake, this famous trout pond, is the major tributary to Nahmakanta Lake. There is a small outlet dam, and MeDIFW recently installed a barrier screen to prevent upstream landlocked salmon (salmon) passage. The Rainbow lake storage and its contribution to the North Twin Impoundment is shown in Figure Attachment 3-67 of Appendix B:Operations Model Study.

Nahmakanta Lake is managed for salmon, Lake, and Brook trout; with only lake trout stocked in recent years. While there is no outlet dam, inflow from

the impounded Rainbow Lake contributes to downstream flow. Nahmakanta Stream was one of three inlet streams included in North Twin Tributary Access study. I find statements in Appendix E-7 contradictory. If the small dams on Dole Brook make the North Branch regulated, why doesn't the small dam on Rainbow lake make Nahmakanta Stram regulated? The Licensee continues with "historical flow date are not available", Figure Attachment 3-67 seems to refute that claim.

The report continues (App E-7) by discussing spawning periods citing MeDIFW (Enfield). The information provided (it) is largely irrelevant as the North Twin Tributary Study where access is much more important than the physical act of spawning. The Licensee would have the reader believe that salmon enter the river and then immediately spawn. This is unfounded and misleading. Salmon are known to enter spawning waters such as the Roach River, the Upper West Branch of the Penobscot River, and Ragged Stream (see Ripogenus Application) early in September when temperatures and flows (often manipulate) are suitable. Thus, any (salmon) redd survey provides NO information on the key issues: the time, source, fish, and any delays in gaining tributary access. Study report of eight (8) Nahmakanta Stram redds simply demonstrate that four – sixteen salmon (salmon often build multiple redds) of unknown origin spawned.

The Licensee continues with results. Despite a great deal of quality high tech effort there were no results that related to the issues at hand: source fish, timing, and accessibility of adult (pre-spawning) salmon to North Twin Impoundment salmon spawning tributaries.

Summary of the 2023 Tributary Accessibility Study

| Water | Salmon present | Time present | Redds found | Source of salmon |
|---|---|---|---|---|
| Joe-Mary inlet | Unknown | - | - | - |
| Nahmakanta Stream | YES | Unknown | 8 | Unknown |
| West Branch | Unknown | - | None found | _ |

The above table provides no new information while raising serious new questions.

1. What is the source of the salmon that spawned in Nahmakanta Stream? Warner and Havey (1985) referred to salmon use of outlet spawning areas. The observed redds were possibly outlet spawner from Nahmakanta Lake or strays from the West Branch.
2. The number of redds (8) found in the .75 mile Nahmakanta Stream reach is well below the average density found in the West Branch downstream of McKay Station; 50-60/mile (Table 16, 1991 Ripogenus Application). This raises serious doubts about the ability of the North Twin tributaries to provide juvenile recruits to the impoundment's adult salmon population.
3. Despite promises to investigate Joe-Mary and the West Branch "tributaries", other than depth, substrate and velocity profiles, no information is provided. Do North Twin Impoundment (pre-spawning) salmon enter these water successfully, or do they attempt to move upstream and fail, due to some factors other than depth, velocity, or other physical barriers?

The study report includes high quality graphics and photos but no new information. The study as propose was a sham and a miss direction away from flow and lake level management critical to environmental and recreational issues. Near useless study results are simply the result of the Licensee's refusal to implement the MeDIFW request for radio tagging.

The MeDIFW request was both logical and necessary for fisheries management goals (self-sustaining salmon populations). Should FERC staff concur they should request that the study be conducted using radio tags. Source fish should be at minimum, from the Pemadumcook and South Twin basins; perhaps 30 fish from each basin. When possible, sexual maturity should be noted. Movement of tagged fish should be monitored at the entrance of the three tributary study streams and in the North Twin Dam forebay.

At some point in the licensing process the Renobscot Mills Project Application and its study reports could undergo formal review. It is unlikely that (independent) professional organization such as the American Fisheries

Society or the National Academy of Science would accept the Licensee's position regarding the refusal to use telemetry in the North Twin Impoundment Tributary Access Study.

I urge FERC to require a tributary access study using radio tagging. The study should begin in September and continue beyond the spawning period ensuring that successful post spawning outmigration occurred.

Thank you for the opportunity to comment and once again urge for a comprehensive North Twin landlocked salmon Tributary Access Study

Ed Spear

307 Mt Hope Ave
Bangor, Me  04401
Email; edspear1@yahoo.com
Phone: 207-217-4288

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, DC 20426
May 14, 2024

OFFICE OF ENERGY PROJECTS

Project Nos. 2572-133 & 2458-247- Maine
Ripogenus Hydroelectric Project
Penobscot Mills Hydroelectric Project
Great Lakes Hydro America, LLC

VIA FERC SERVICE

Kirk E. Francis, Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis, THPO
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

**Reference: Communication with Penobscot Indian Nation**

To the Tribal Leaders Addressed:

As part of relicensing the Ripogenus and Penobscot Mills Hydroelectric Projects, Commission staff solicited study requests and comments on the Pre-Application Document (PAD).[1] The Penobscot Indian Nation, through its representative Mr. Daniel McCaw, Fisheries Program Manager of the Penobscot Indian Nation, submitted comments on the PAD, study requests, and Proposed Study Plan.[2] Mr. McCaw requested, among other things, that a socioeconomic working group be established, and noted Environmental Justice concerns associated with the projects. These concerns were

[1] *See* Notice of Intent to File License Applications for New License and Commencing Pre-filing Process, Dockets P-2458-247 and Docket P-2572-133 (Aug. 10, 2021).

[2] *See* Penobscot Indian Nation Comment, Dockets P-2458-247 and Docket P-2572-133 (Oct. 13, 2021); Penobscot Indian Nation Comment, Docket P-2458-247 (Feb. 22, 2022).

considered as Commission staff developed the Study Plan Determination (SPD) for the projects.

Specifically, we required in the SPD that Great Lakes Hydro America, LLC (GLHA) conduct an Environmental Justice study in consultation with the Penobscot Indian Nation and other interested relicensing stakeholders. Since Mr. McCaw's last filing in 2022, we have reached out by telephone to Mr. McCaw on two occasions, each time leaving a voice message, and have not received a response. Additionally, GLHA reached out to the Penobscot Indian Nation via telephone and email in March and April of 2024; however, GLHA reports that Penobscot Indian Nation has not yet responded to this outreach.[3]

By this letter, we are trying to ensure that the Penobscot Indian Nation is receiving these project updates and invitations to participate in the relicensing process. We would like to know if there is an alternative preferred method of communication than documents posted to the eLibrary docket or phone calls to Mr. McCaw. Finally, we wanted to highlight that Updated Study Report meeting is planned for May 15 and 16, 2024 with options to participate both virtually and in-person in Bangor, Maine.[4]

[3] GLHA Appendix O at O-16, Dockets P-2572-133 and P-2458-247 (Apr. 22, 2024).

[4] *See* GLHA Cover Letter, Dockets P-2572-133 and P-2458-247 (Apr. 22, 2024). *See* Accession Number: 20240422-5168. On the first page of the cover letter, GLHA gives details regarding how to participate in this meeting and requests that agencies or stakeholders who plan on attending the meeting to RSVP by contacting Cate Russell at Cate.Russell@hdrinc.com or by phone at (207) 239-3792.

If you have any questions or comments, please contact Dustin Wilson at (202) 502-6528, or at dustin.wilson@ferc.gov. Mr. Wilson will contact you shortly to follow-up on this letter.

Sincerely,

Stephen Bowler, Chief
South Branch
Division of Hydropower Licensing

Cc:

Daniel McCaw
Fisheries Program Manager
12 Wabanaki Way
Indian Island, ME 04468

Dan Kusnierz
Water Resources Program Manager
12 Wabanaki Way
Indian Island, ME 04468

Debbie-Anne A. Reese, Secretary May 23, 2024
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426
Comment on **Great Lakes Hydro America May 16, 2024,** Updated Study Report **meeting with a focus on McKay Station spawning and incubation flow of** 1422 cubic feet per second

Dear Secretary Reese: Via Electronic Filing

During the May 16, 2024 Updated Study Report (USR) meeting a stakeholder asked when the current Ripogenus Project West Branch of the Penobscot River (West Branch) spawning and Incubation flow (1422 cfs) would be discussed. A very reasonable request, sharply rebuked. Several members of the Great Lakes Hydro American's USR team (the Licensee) responded that there would be no discussion and the stakeholder(s) should simply "read the Application". As with many of the Licensee's statements and positions, this was both incorrect and misleading.

As a then Great Northen Paper (GNP) fisheries Biologist, I collected the fisheries information and co-authored the 1991 Ripogenus Project License Application Fisheries Report. This report included extensive data collection, including Landlocked salmon (salmon) redd surveys, during the 1977-1991 period.

I then participated in the subsequent licensing process that included formulating/refining flow and lake level targets. This was during the period when GNP's paper making energy needs were 24/365, flow interruptions were rare. Outages of any type impacted paper making production power demands and river flow was restored as soon as possible.

During the crafting of 1996 Ripogenus Project license articles it become apparent to the resource agencies and FERC Staff that the historic minimum flow of 200 cfs was inadequate and new minimum flow limits needed to be established. The inherit assumption (later proved to be in error) was that base flows would remain in the 2500 cfs range to meet GNP's paper making needs. Minimum flow requirements were increased, long term outages were set at 1100 cfs (later reduced to 1000 cfs to optimize turbine efficiency). Spawning and incubation flows were arbitrarily set using a generic US Fish and Wildlife's Aquatic Base Flow recommendations, 1422

cfs. Minimum operating flows e.g., 2400 cfs were never considered as the thought of a shuttered mill was too horrific to consider.

During the May 16, 2024 USR meeting, several members of the Licensee's team insisted that information on the 1422 spawning and Incubation flow could be found in the 2021 Pre-Application and accompanying documents. This is incorrect and represents a continuation of the narrative "everything is great, no new studies are needed. Trust us". In fact, there is simply **no information on the suitability** of the 1422 cfs ABF flow. The burden of proof to demonstrate the validity of their proposed flow (1422 cfs) lies with the Licensee.

Any spawning flow, including the ABF, being presented in the Draft License Application needs to be verified. Rather than the Licensee "cherry picking" study sites, I urge FERC to recommend the areas immediately above and or below Line Pool, critical spawning areas. Salmon need accelerating velocities to provide flow during redd construction and to maintain interstitial flow during incubation. Any meaningful flow study should include depth and corresponding nose velocities at and (one foot) upstream of substrates judged suitable for spawning at 1422 cfs and 1800 cfs. Substrates should be quantified including the percentage of fines and organic material. Should flows be lower than the study flow, area selected as suitable for salmon spawning should be confirmed post spawning e.g. late November. Given the Licensee's technological capabilities, the area(s) should be mapped.

The Holbrook Bypass Spawning and Incubation Channel (Holbrook Bypass), Article 406 of the Ripogenus License, was a cornerstone of the final License. This critical mitigation measure was designed to improvement juvenile (parr) recruitment, a factor limiting the abundance of West Branch salmon. This critical juvenile salmon production area was designed to operate at historic GNP Mill flows, flows in the 2500 cfs range. The Licensee's change in project operation from relatively stable base flows to a peaking regime eliminates the Holbrook Bypass design benefit. Should salmon continue to use the Holbrook Bypass at these low flows, protection of incubating eggs needs to be confirmed in the event that November-April McKay flows fall to the 1000 -1422cfs range.

Other than studies conducted under the historic (GNP) stable base flows conditions, there is virtually no information relating to West Branch spawning and

incubation flows below McKay Station.  These two critical salmon life stages have not been a focus of studies, subsequent discussions and or future license requirements. This represents a major data gap. I urge FERC Staff to request this much-needed information.

Thank you for the opportunity to comment on protection of these critical salmon life stages and the need for vital current information.

Ed Spear

307 Mt Hope Ave
Bangor, Me 04401
Email; edspear1@yahoo.com
Phone: 207-217-4288

Jeffrey Norment, Glenburn, ME.
McKay station dam water releases and water management needs to be more consistent to ensure not only power production, but also to ensure maximum water conditions to ensure the world famous downstream fishery and white water rafting and kayaking are maintained. Since Brookfield took over management of the dam, there have been significant fluctuations in flows that have adversely affected the existing native brook trout and landlocked salmon fishery. Water is often too low during critical times of year, especially during the heat of summer, and is adversely affecting fish recruitment. More strict minimum flow and more consistent flows during critical spawning and to ensure survival of younger age classes of fish is needed. Thank you for considering this request during re-licensing.

Brookfield
Renewable U.S.

May 31, 2024

***Via eFiling***

Debbie Anne Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Updated Study Report Meeting Summary**

Dear Acting Secretary Reese:

Great Lakes Hydro America, LLC (GLHA), the Licensee of the Ripogenus Hydroelectric Project (No. 2572) and the Penobscot Mills Hydroelectric Project (No. 2458) (collectively referred to as the "Projects"), herein files with the Federal Energy Regulatory Commission (FERC) the Updated Study Report (USR) Meeting Summary for the relicensing of the Projects. The Projects are located on the West Branch Penobscot River and Millinocket Stream in Piscataquis and Penobscot counties, Maine.

On June 11, 2021, GLHA filed the Notices of Intent and a Pre-Application Document (PAD), which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through FERC's Integrated Licensing Process (ILP). On March 23, 2022, GLHA filed the Revised Study Plan (RSP) and on May 13, 2022, FERC issued the Study Plan Determination (SPD). Pursuant to the RSP, and as modified and approved by FERC's SPD, GLHA performed study activities in 2022 and early 2023 for which available results from the study activities were provided in the Initial Study Report filed with FERC on April 24, 2023.

Pursuant to FERC's second SPD issued on September 19, 2023, GLHA performed additional study activities in 2023 and early 2024 for which available results from the study activities were provided in the Updated Study Report (USR) filed with FERC on April 22, 2024. On May 15-16, 2024, GLHA held the USR Meeting in Bangor, Maine with FERC staff and other relicensing participants and is filing the enclosed USR Meeting Summary.

Concurrent with this filing, GLHA is providing a copy of this letter to all parties listed in the attached distribution list. Parties can download an electric copy of the public portions of the USR Meeting Summary from FERC's eLibrary system at https://www.ferc.gov/ferc-online/elibrary by conducting a search using the docket numbers P-2458 and/or P-2572.

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

If you have any questions regarding this letter or the USR Meeting Summary, please contact me by phone at (315) 566-0197 or by email at michael.scarzello@brookfieldrenewable.com.

Sincerely,



Michael Scarzello
Manager, Licensing
Brookfield Renewable U.S.

cc: Relicensing Distribution List

Enclosed: Updated Study Report Meeting Summary

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Pre-Application Document
Distribution List

**Federal Agencies**

Rachael Mangum, MA, RPA
Assistant Director
Federal Permitting, Licensing, and Assistance Section
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001

Glori James-Suarez
Realty Specialist
Northeastern States
Bureau of Land Management
250 E. Wisconsin Avenue, STE 1100
Milwaukee, WI 53202

Lori A. Ehrlich
Region 1 Administrator
Region 1
Federal Emergency Management Agency
99 High Street, Sixth Floor
Boston, MA 02110

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Debbie-Anne A. Reese
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
19 West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Maine Project Office
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

Leonard Rawlings
FERC Coordinator
Eastern Region
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Joseph Bishop
Water Division Hydro Coordinator
New England Region
U.S. Environmental Protection Agency
5 Post Office Square
Boston, MA 02109

Karen McGuire
New England Region 1
Deputy Regional Administrator
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Kyle Olcott
Hydropower Coordinator
Maine Field Office
U.S. Fish and Wildlife Service
306 Hatchery Road
East Orland, ME 04431

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

**State Agencies**

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Laura Paye
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Erin Wilson
Coastal Policy Specialist
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Peter Jamieson
Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
40 Western Avenue
E.S. Muskie Federal Building, Room 412
Augusta, ME 04330

Stacey Guerin
State Senator
3 State House Station
Augusta, ME 04333

Kathy Irene Javner
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, Maine 04333

Trey Stewart
State Senator
3 State House Station
Augusta, ME 04333

James Lee White
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, ME 04333-0002

**Native American Tribes**

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Rena Newell
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

**Additional Parties**

Dr. Andrew Fisk
Northeast Regional Director
American Rivers

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Jesika Lucarelli
Great Mountain Guide Service

Mark Nadeau
International Association of Machinists
245 Pamola Park
Millinocket, ME 04462

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Arthur Dickey
Maine Rafting Expeditions

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing

Matt Polstein
New England Outdoor Center

Jim Murton
North Country Rivers

Jeremy Hargreaves
Northeast Whitewater

Derek Heady
Northeast Whitewater

Suzie Hockmeyer
Co-founder
Northern Outdoors, Inc.
1771 US Rt 201
The Forks, ME 04985

Emily Yearwood
Northern Outdoors, Inc.
1771 US Rt 201
The Forks, ME 04985

Michael Smith
Outdoor Sport Institute
176 Highland Ave
Millinocket, ME 04462

Kenny DeCoster
Vice President
Penobscot Paddle and Chowder Society

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Amanda Williams
Representative for Allagash Gateway Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Tom Tyler
President
Sportsman's Alliance of Maine
205 Church Hill Road
Augusta, ME 04330

Jimmy Doria
Three Rivers Whitewater

Neil Hagstrom
Trout Unlimited

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,

Dean Beaupain

Jeff Fayle

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Christopher Howe

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Charles Paone

Richard Parkes

Edward Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Robert Van Deventer

June 5, 2024

Ms. Debbie-Anne Reese
Acting Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Via online submission to: http://www/ferc.gov**

Subject: **Status of Consultation for Studies for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458)**

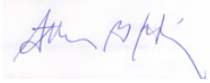
Dear Acting Secretary Reese:

On behalf of its six chapters and over 2,000 members, Maine Council of Trout Unlimited (TU) submits the attached email thread regarding studies for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) filed for Great Lakes Hydro America, LLC by Brookfield Renewable ("Brookfield" or "Applicant") so that it is part of the record.

TU had asked Brookfield through its contractor Jesse Wechsler for a response to his email regarding consultation and the Ramping Study by May 31, 2024 and that has not been not forthcoming. We reiterate this request.

TU asked at the Updated Study Report Meeting that Brookfield provide the bases for Ripogenus Project flows of 1422 cfs, 1300 cfs and 1000 cfs that are in the current license. Rather than respond to the request, Brookfield stated that it was in the record without reference to where it was located. TU reiterates that request which was included in the attached email.

Respectfully,



Stephen G. Heinz
Maine TU Council FERC Coordinator

**Attachment**

Email thread Stephen Heinz (TU) and Jesse Wechsler (Brookfield)

# Attachment



**From:** **Stephen Heinz** heinz@maine.rr.com
**Subject:** Re: Ripogenus Project Ramping Study Planning
**Date:** May 23, 2024 at 3:03 PM
**To:** Jesse.Wechsler@kleinschmidtgroup.com Jesse.Wechsler@KleinschmidtGroup.com
**Cc:** Tim Obrey Tim.Obrey@maine.gov, John Perry John.Perry@maine.gov, Wendy Bley Wendy.Bley@Kleinschmidtgroup.com, Ed Spear edspear1@yahoo.com, Kyle Olcott dudley_olcott@fws.gov, Randy Dorman randy.dorman@brookfieldrenewable.com, Michael Scarzello Michael.Scarzello@brookfieldrenewable.com, Allan Creamer allan.creamer@ferc.gov, Osborne, Michael michael.osborne@brookfieldrenewable.com

---

Jesse,

Thank you for the clarification.

TU expected be able to conduct substantive discussions of the Ramping Study combined with year two of the Stranding Study at the USR Meeting based on the content of Brookfield's Filing of May 3 that stated: “GLHA looks forward to discussing the study at the USR Meeting." Despite TU noting this at the very beginning of the meeting, no substantive discussion occurred beyond Brookfield stating that the study would likely be delayed until September and that consultation with stakeholders was ongoing. TU had proposed September of early October, the same timeframe that the year 1 Stranding study was conducted. TU supports this later date because milder weather conditions would be less likely to cause mortality of salmon parr and macro-invertebrates, and would not be during the fishing season, but we will not object to conducting it in late July or August. Consultation between Brookfield and TU was minimal for the Stranding Study, but did result in moving some of the study area from areas where strandings were not expected to areas where they were. For the Wadability/Fishability Study, consultation was virtually non-existent: participants were not given key details of the study until they arrived to participate such as specific locations or flows. One of the Brookfield contractors stated at the USR Meeting that none of the volunteers objected to the study methods when it was conducted. It is unrealistic to think that volunteers showing up in the field to participate in a study could do the analysis required in the field on the fly.

The Ramping Study that TU received with your April 26 email assumed TU volunteer participation. TU was not asked if it wished to participate in data collection for the study. TU may want to sample other areas when the study is conducted as we did with the Stranding Study. Conducting relicensing studies is the responsibility of the applicant. TU currently has no paid employees in Maine and any support which we supply is on our members' own time and at their own expense. Few live within easy driving distance of the Ripogenus Project, and most have to find lodging at their own expense to participate in West Branch studies. They are under no obligation to participate and should not be counted on to collect data and certainly without asking if we wished to be used in that manner. We may put independent observers in the field as we did for the Stranding Study where we covered different areas than the formal study did and would appreciate advance notice of its timing and details.

Our participation in the Wadability/Fishability Study was driven by our conclusion that contractor observers would be unqualified to make determinations of either wadeability or fishability over any range of flow. We were not consulted on the details of the study and were disappointed that the range of flows was limited to under 400 cfs. TU’s general comments on the study were that ‘the validity would be dependent on the range of flows provided.’ We anticipated that the three flows that would be provided would cover a larger range. Although bladder systems are not generally used to control flows from dams, Brookfield does use it to control flows within the system to control Millinocket Development ramping rates:

> "Whenever abnormal conditions occur such that a flow cannot be passed through the generators at the Millinocket Powerhouse to achieve the 2,000 cfs minimum flow, the inflatable rubber flashboard system shall be deflated to release flows in an expeditious effort to minimize downriver effects on water quality and aquatic habitat. Except for the initial 2-minute siren warning and a safety flow of 200 cfs for 15 minutes, such flows will not be ramped. The protection of downriver water quality and aquatic habitat is a higher priority than prevention of channel scouring and destruction of vegetation in the Back Channel. During periods of high seasonal flows, the initial 2-minute siren warning and safety flow of 200 cfs for 15 minutes will also be used. Following this 15-minute release, increases of 400 cfs per hour will be made until either the required flow is met, the elevation at Stone Dam is less than 459.45 feet, or the inflatable rubber flashboard system is fully deflated, if necessary. *The ramping up of seasonal flows in the Back Channel will be done only after the hydraulic capacity of those units available has been attained.*” [Source: https://lowimpacthydro.org/wp-content/uploads/2020/07/20190603-Initial-LIHI-Application-Millinocket-Dolby.pdf -page 29, italics supplied].

Less than half the flow that maximized macro invertebrate habitat or adult landlocked salmon habitat that Brookfield Aquatic Habit Study indicated was provided for the Wadability/Fishability Study.

I was surprised that Ed Spear was not included on your April 26 email. Ed has spent more time and done more study of the West Branch fishery than anyone, and his knowledge and experience are invaluable. TU agrees with the comments in his FERC filing of May 1 that supported our requests that the study be conducted in late September or early October. They also reflect TU’s analysis that there is no value in sampling the Big Eddy Pool and alternative sites should be included:

> 'As designed, the RSP includes only about 10 percent of critical salmonid spawning areas (Vol IX 1991 Ripogenus Project Application Table 16) and perhaps a third of salmonid nursey and aquatic insect habitat. This oversight can easily be corrected by including the two flow sensitive areas (either the gravel bar above Line Pool or the relatively long gravel area beginning at the end of Line Pool ) immediately above Nesowadenhunk Deadwater“ and removing the “below Big Eddy Site”. This minor change will include the “Horserace”, prime nursery habitat, and the major spawning areas, Little A Deadwater and the two combined “head of Nesowadenhunk Deadwater” sites. The third major spawning area is the pool immediately below Abol Bridge and is downstream of the reaches of apparent study interest although it is thought to be critical to the North Twin Impoundment salmon population.'

Ed’s comments go on to request inclusion of sampling of macro-invertebrate drift, a key feature of the studies conducted by Smokorowski and others. Incorporating this represents an opportunity to further inform the relicensing, and better determine of the full effects of peaking below McKay station. He goes no to say:

> "Aquatic insects provide critical forage for juvenile salmon and as maintenance food items to adult salmon during summer periods. The RSP addresses aquatic communities only in terms of mortalities. They then continue by quoting Smokorowski et al (2011) implying that they are familiar with work done by Smokorowki, Marty and others on the Magpie and Batchawana Rivers. Impressive work, sponsored by the Licensee.
>
> The Licensee correctly identified Smokorowski and other’s work but failed to include their reports of increased aquatic communities “drift” and population shifts resulting from unramped peaking. The literature is replete with publications concerning aquatic insect drift (or movement) caused by peaking as well as emergency outages. This phenomenon should be addressed in

the RSP. My filing of February 14, 2022 (accession No. 20220214-5027) provided details of impacts resulting from unramped peaking and regulated flows and an accompanying list of peer reviewed references. I see no need to repeat well-known science.

I suggest the RSP be modified and include aquatic community drift before, during, and after flow changes. For all sample sites, duplicate metered, drift nets should be set in a fixed position for two hour periods just prior to flow increases; emptied and set again immediately as flow rises; removed before a flow change, and then reset for a two hour period after flows are increased. As mentioned above, to avoid bias caused by the sometimes crepuscular/diel aquatic insect behavior, sampling should be mid-day."

TU would like to build on Ed's comments. The Ramping Study as written is not a ramping study but an exercise to verify that normal switching between 1, 2 and 3 generator operations does not strand fish. If it shows that stranding does not occur when this happens, then it does not make sense to look at smaller increments of flow change - except at lower flows. As TU stated in its April 30 email:

"TU is still unaware of data supporting the flows that comprise the terms and conditions of the current license. The 400 cfs trip event flows allowed under the current license have been demonstrated to cause extensive mortality to fish and macro-invertebrates. If data exists to justify 1000 cfs as a minimum flow in terms of strandings, then please direct us to the study data that shows that. Similarly, if data exists to justify spawning and incubation flow of 1422 to 1300 cfs, then please direct us to that as well. To our knowledge, the 1422 cfs only reflects the general guidance for minimum flow developed by USFWS for New England waters: the catchment area in square miles. More specific data is needed to condition the new license."

In any case, the scope of the study needs to be expanded to include examination of the range of flows from 1422 cfs down to the 500 cfs that the Stranding Study has conclusively shown to cause extensive mortality, especially to landlocked salmon parr. If this is not incorporated into the Ramping Study, then additional delays to those already caused by the failure go two McKay Station generators on July 8, 2023 will be incurred when it is recognized that the current minimum, spawning and incubation flows are not based on data.

I spoke with Allan Creamer at the USR Meeting on May 16, and he said he had looked and the only flow study he could locate was an IFIM study for Ripogenus Gorge. This is completely the opposite of what Brookfield asserted in response to my multiple requests that Brookfield identify the studies supporting current license flows. We are well into the relicensing process and still lack data justifying the flows in the current license that we expect Brookfield will apply to have continued in the new license.

TU proposed both the Stranding Study and the Ramping Study. We appreciate the opportunity to provide input to the consultation. Please reply by May 31, 2024.

Thanks again,

Steve Heinz
Maine TU Council FERC Coordinator
207 781-4762 (voice/fax only)

> Begin forwarded message:
>
> **From:** Stephen Heinz <heinz@maine.rr.com>
> **Subject: Re: Ripogenus Project Ramping Study Planning**
> **Date:** April 30, 2024 at 8:01:52 AM EDT
> **To:** "Jesse.Wechsler@kleinschmidtgroup.com" <Jesse.Wechsler@KleinschmidtGroup.com>
> **Cc:** Tim Obrey <Tim.Obrey@maine.gov>, John Perry <John.Perry@maine.gov>, Wendy Bley <Wendy.Bley@Kleinschmidtgroup.com>, "Michael.Scarzello" <Michael.Scarzello@brookfieldrenewable.com>, Kyle Olcott <dudley_olcott@fws.gov>, Amanda Cross <amanda_cross@fws.gov>, Jeff Murphy <jeff.murphy@noaa.gov>, Jim Vogel <jim.vogel@maine.gov>, Matt Streeter <mstreeter212@gmail.com>, Laura Paye <laura.paye@maine.gov>
>
> Dear Jesse,
>
> Thank you for including TU in the coordination of the upcoming Ramping Study.
>
> We are surprised that you would choose the weeks of highest aquatic biological activity to conduct the study. The weeks that you propose are during the largest hatches of caddis flies and greatest period of stonefly emergence. The study would perturbate the lifecycle of the insects and the fish that feed on them. Besides that, landlocked salmon fry would be very young then and vulnerable to changes in flow conditions. In mid-June, water temperatures and air temperatures will likely be fairly high so any strandings that might occur would be more likely to result in mortality than if the study were conducted either earlier or later in the year.
>
> These are also the weeks that most Maine trout fishermen want to be on the water, so it is doubtful that TU would be able to recruit enough volunteers to assist with data collection if we supported these dates. Local guide and campground businesses would also likely suffer.
>
> TU proposes that the studies be conducted in late September or early October as we expected would have been done last year.
>
> TU intends to propose a safe flow study be conducted as an adjunct to the Ramping Study and proposes to discuss this at the upcoming USR Meeting in Bangor. TU is still unaware of data supporting the flows that comprise the terms and conditions of the current license. The 400 cfs trip event flows allowed under the current license have been demonstrated to cause extensive mortality to fish and macro-invertebrates. If data exists to justify 1000 cfs as a minimum flow in terms of strandings, then please direct us to the study data that shows that. Similarly, if data exists to justify spawning and incubation flow of 1422 to 1300 cfs, then please direct us to that as well. To our knowledge, the 1422 cfs only reflects the general guidance for minimum flow developed by USFWS for New England waters: the catchment area in square miles. More specific data is needed to condition the new license.
>
> Please provide an email response to this by noon, Monday, May 6.
>
> Thanks again,
>
> Steve Heinz
> Maine TU Council FERC Coordinator
> 207 781-4762 (voice/fax only)

> On May 23, 2024, at 1:06 PM, Jesse Wechsler <Jesse.Wechsler@KleinschmidtGroup.com> wrote:

Hi Steve –

Confirming for you that no additional communication has gone out on this topic and providing you with the latest update.

Per MDIFW's recommendations on May 2, we are now looking to perform the study in back-to-back weeks in the 2nd ½ of July or in August. We anticipate two days of field work (1 day in each week). We are currently discussing the timing with GLHA to make sure that this will work operationally and to identify specific dates for the field work. We also need to make sure that the new timeframe will work for the rafting outfitters.

Per the study plan, we are planning to form teams of three (1 staffer from TU, MDIFW, and GLHA/KA) for each of the three study sites.

This timing should also allow us to include the results of the study in the Final License Application, which is due to FERC by 9/30.

Due to planned outages and MDIFW permit restrictions, we are not able to perform the study in October.

I plan to develop a detailed schedule soon and send it back out to the group.

Thank you!
Jesse

**Jesse Wechsler**
**Senior Environmental Scientist and Project Manager**
**Office: 207-416-1278**
www.KleinschmidtGroup.com
*Providing* **practical** *solutions for* **complex** *problems affecting energy, water, and the environment*

---

**From:** Stephen Heinz <heinz@maine.rr.com>
**Sent:** Wednesday, May 22, 2024 4:14 PM
**To:** Jesse Wechsler <Jesse.Wechsler@KleinschmidtGroup.com>; Tim Obrey <Tim.Obrey@maine.gov>; John Perry <John.Perry@maine.gov>; Wendy Bley <Wendy.Bley@Kleinschmidtgroup.com>; Ed Spear <edspear1@yahoo.com>; Kyle Olcott <dudley_olcott@fws.gov>; Dorman, Randy <randy.dorman@brookfieldrenewable.com>
**Cc:** Michael Scarzello <Michael.Scarzello@brookfieldrenewable.com>; Allan Creamer <allan.creamer@ferc.gov>
**Subject:** Re: Ripogenus Project Ramping Study Planning

All,

At the USR Meeting in Bangor last week, I understood that Jesse Wechsler or Brookfield would get back to us regarding "ongoing consultations" involving the upcoming Ramping Study, and combining it with the rest of the Stranding Study. TU was the organization that proposed both studies.

When I spoke with Dave Scarzello this morning at the FERC DEIS Hearing on the

Shawmut Project in Augusta, he said that something had been sent out earlier this week.

I have looked back through my emails and checked the FERC docket and cannot find any new emails or new FERC filing to the docket related to the Ramping Study.

If an email was sent, please forward it to me at your earliest convenience. TU has inputs.

Thanks,

Steve Heinz
Maine TU Council FERC Coordinator
207 781-4762 (voice/fax only)

> On Apr 26, 2024, at 4:44 PM, Jesse Wechsler <Jesse.Wechsler@KleinschmidtGroup.com> wrote:
>
> Good afternoon all,
>
> On behalf of GLHA, I am writing to provide an update and to start coordinating with you on the upcoming ramping study at the Ripogenus Project. As you might recall and as described in documents filed with FERC in 2023 as part of the current relicensing effort, GLHA is planning to study the effects of the following two operational scenarios at the Ripogenus Project on downstream fish and aquatic resources:
>
> - Changing from 3-unit operation (~3,500 cfs) to 2-unit operation (~2,300 cfs) to 1 unit operation (~1,100 cfs) (holding at 2-unit operation for 1 hour before going to 1-unit operation).
> - Changing from 3-unit operation (~3,500 cfs) to 1-unit operation (~1,100 cfs) by simultaneously shutting down the other two units.
>
> The study plan, which has been approved by FERC, is attached as reference.
>
> GLHA originally planned to complete the study in the fall of 2023 but was unable to do so because of excess precipitation and scheduled maintenance activities at the McKay Station, which resulted in one or more turbine units being unavailable for the study.
>
> On April 10 of this year, GLHA consulted with members of the rafting

community (i.e., the New England Outdoor Center and other members) at the annual Whitewater Outfitters Meeting to identify dates for the ramping study that would not affect planned recreational and rafting activities in the West Branch. Based on requests from the rafting community and the need to avoid planned maintenance outages this fall, GLHA is targeting this study to occur on two days over back-to-back weeks in June. Specifically, the planned dates are Wednesday June 12 and Wednesday June 19. A target study schedule is attached, showing the planned timeline for operational changes, river flows, and field monitoring activities.

As described in the study plan, the intent is to develop three small field teams that include one representative from TU, GLHA, and MDIFW for each of the 3 sites. We envision this year's study will rely on small teams working together to evaluate the effects of these flow changes on fish and aquatic resources.

As we continue planning the field study, could you please confirm whether your organization will take part, and if so, provide contact information for specific individuals so that we can coordinate directly with team members?

Please feel free to contact me with any questions.

Thank you!

**Jesse Wechsler**
**Senior Environmental Scientist and Project Manager**
**Office: 207-416-1278**
www.KleinschmidtGroup.com
*Providing* **practical** *solutions for* **complex** *problems affecting energy, water, and the environment*

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426
June 14, 2024

OFFICE OF ENERGY PROJECTS

Project Nos. 2572-133 & 2458-247 –
Maine
Ripogenus Hydroelectric Project
Penobscot Mills Hydroelectric Project
Great Lakes Hydro America, LLC

**VIA FERC Service**

Michael Scarzello, Licensing Manager
Great Lakes Hydro American, LLC
c/o Brookfield Renewable U.S.
399 Big Bay Road
Queensbury, New York 12804

**Reference: Staff Comments on Updated Study Report and Updated Study Report Meeting Summary**

Dear Mr. Scarzello:

Commission staff has reviewed Great Lakes Hydro America, LLC's (GLHA) Updated Study Report (USR) and associated study reports for the Ripogenus and Penobscot Mills Projects filed April 22, 2024, attended the USR Meeting held May 15 and 16, 2024, and reviewed the USR Meeting Summary filed May 31, 2024. Based on staff's review of the USR, associated study reports, and USR Meeting Summary, as well as discussions at the USR Meeting, staff's comments are provided in Attachment A.

Please contact Allan Creamer at (202) 502-8365, or at allan.creamer@ferc.gov, if you have any questions.

Sincerely,

Stephen Bowler, Chief
South Branch
Division of Hydropower Licensing

Enclosures: Attachment A – Staff's USR and USR Meeting Summary Comments

**Attachment A – Staff's USR (Updated Study Report) and USR Meeting Summary Comments**

McKay Station Flows

1. During the Updated Study Report (USR) Meeting, held May 15 and 16, 2024, the Maine Council of Trout Unlimited (Maine TU) requested information regarding the biological basis for the McKay Station flows required by the existing license.[1] Great Lakes Hydro America, LLC (GLHA) noted, without elaboration, that the requested information was in the record. The record developed during the prior relicensing, including that which supports the existing flow requirements for McKay Station, is voluminous. Thus, we encourage GLHA to work with the stakeholders to find information in record that helps them understand the existing license requirements, including the flows for the West Branch of the Penobscot River downstream from McKay Station. Moreover, to facilitate Commission staff's understanding of the adequacy of the existing McKay Station flow releases, as well as any proposed changes to those releases, the final license application for the Ripogenus Project should include a detailed description of the biological basis for the existing and proposed flows.

McKay Station Fish Stranding Study

2. The USR, filed April 22, 2024, did not specifically list the McKay Station Ramping Rate Study or the McKay Station Fish Stranding Mitigation Study, which were required by the September 19, 2023, Determination on Requests for Study Modifications and New Studies (Study Determination), among the 15 studies to be discussed during the USR Meeting.[2] Instead, GLHA proposes to complete these two studies in 2024 in consultation with the Maine Department of Inland Fish and Wildlife (Maine DIFW), the U.S. Fish and Wildlife Service, and Maine TU, with a report detailing the results filed as a supplement to the USR.[3]

   During the USR Meeting, on May 15, 2024, a Maine TU representative asked GLHA about the schedule for consulting on, and completing, the McKay Station Ramping Rate Study. GLHA responded that the ramping study would be delayed until

[1] Maine TU's June 5, 2024, Filing at 2.

[2] Table 4-1 in the USR lists the McKay Station Ramping Rate Study as on-going, and the McKay Station Fish Stranding Mitigation Study was not mentioned.

[3] *See* GLHA's May 3, 2024, Filing.

September and that consultation was on-going.[4] After consulting with Maine DIFW, the dates for completing the study changed to the latter half of July or August.[5] It appears that Maine TU was not consulted on the schedule change, as required by the Study Determination.[6] Moving forward, please manage these two studies with a proactive and inclusive approach to stakeholder consultation and involvement, including (a) informing Maine TU and other interested stakeholders of these study schedules and any changes, and (b) providing the final study plan(s) to stakeholders prior to implementing the study(ies).

Terrestrial, Wildlife, and Botanical Resources Study

3. During the USR Meeting, on May 16, 2024, Commission staff commented on the benefits of integrated vegetation management in transmission line rights-of-way, particularly in sensitive areas such as habitat for Rare, Threatened, and Endangered species that potentially occur in the project area. Additionally, staff noted that the proposed endangered tricolored bat likely occurs in the project area. Finally, as was stated in the Study Plan Determination,[7] staff reiterated that the final license application should: (1) include an assessment of the potential effects of project operation and maintenance on all federally listed and proposed listed species, and include any proposed protection, mitigation, and enhancement measures to protect those species; and (2) describe all vegetation management practices that occur within the project boundary.

Whitewater Boating Assessment Study

4. In the Determination on Requests for Study Modifications and New Studies, Commission staff stated that a Whittaker Level 2 study for boating the West Branch downstream from Stone Dam would: (a) identify the reach's flow-dependent attributes; (b) assess the feasibility and potential quality of boating opportunities there; and (c) estimate necessary flow ranges for boating the river.[8] The Study Determination required that the Whittaker Level 2 study include boating this reach to

[4] Maine TU's June 5, 2024, Filing at 2.

[5] *Id*. at 4

[6] Director's September 19, 2023, Determination at C-6.

[7] Director's May 13, 2022, Determination at B-31.

[8] Director's September 19, 2023, Determination at B-28.

"Assess the feasibility and potential quality of boating opportunities and estimate flow ranges by boating the river at a single flow." [9]

Whittaker *et al*. (2005) states that a Level 2 on-water study by boat is similar to an on-land boating assessment, with the addition of experienced boaters running the subject reach, often using an evaluation form designed to capture observations from the run. After the run, focused group discussion of the observations would take place to seek findings regarding the boating opportunities, flow ranges, and potential project effects of boating the subject reach.

The USR includes a preliminary second-year Whitewater Boating Study Report.[10] This report mentions that a land-based Whittaker Level 2 study is planned for the summer of 2024. As required by the approved study plan, this land-based assessment should be paired with an on-water study by boat, with experienced boaters at a single flow, using an appropriate evaluation form, and followed by a focused group discussion to assess the reach's boating feasibility, flow-dependent attributes, and the potential flow ranges for boating.

[9] For more information, please refer to Whittaker, D., B. Shelby, and J. Gangemi. 2005. Flows and Recreation: A guide to studies for river professionals. Whittaker, Shelby, Gangemi, & the Hydropower Reform Coalition.

[10] *See* Appendix M of the USR.

Debbie-Anne A. Reese, Secretary June 20, 2024
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426,

Ripogenus Hydroelectric Project (FERC No. 2572-133) Comments on Great Lakes Hydro America Supplement to Updated Study Report, May 3, 2024. Re; Ripogenus Hydroelectric Project Article 406, The Holbrook Bypass Channel and the appropriateness of conclusion regarding the functionality of this system as it exists.

Dear Secretary Reese Via electronic filing

This filing attempts to correct assertions made in the Great Lakes Hydro America (Licensee) May 3, 2024 Supplement to Updated Study Report regarding Article 406, Holbrook Bypass Channel (Bypass Channel). Without any empirical proof, the Licensee contends that, despite frequent dewatering, this mitigation measure is providing the intended enhancement to young-of-the-year Landlocked salmon (salmon) production. This is not the case. As the May 3, 2024 filing is part of the record, the Licensee's erroneous conclusion needs to be corrected.

"Current" Bypass Channel fisheries information is limited to an August 4, 2021 Maine Department of Inland Fisheries and Wildlife electrofishing report. This "time available" data collection found numerous juvenile brook trout, no salmon parr, and several young-of-the-year salmon. This is not the structure of fish population described in the 2003 (then) Great Northen Paper filing (Accession No 20030102-01200). Project operation and frequent low flow events have turned the Holbrook Bypass Channel into a brook trout nursery area. This is not the goal of Article 406.

In their May 3, 2024 filing the Licensee attempts to refute claims that low McKay Station flows were/are not in violation of Holbrook Bypass Channel, Article 406, license requirements. The constant violation of Article 406 flow requirements and stranding of fish and aquatic macro invertebrates are two distinct and separate issues and require two separate studies.

The Licensee attempts to dismiss claims of continuous Article 406 violations based on observations made during a (fish) stranding study. The study was designed for mainstem river reaches with rock/boulder lined shorelines and

occasion high gradients and not for a small stream lacking pocket pools and boulders with a wide thalweg. As is often the case, the Licensee makes statements not supported by river flows coupled with Bypass Channel flows, velocities, and depths time series. In future studies, these physical parameters can be linked to Bypass Channel fish and aquatic communities' abundances.

*"The benefits of this mitigation measure were validated by GLHA's 2022 Fish Stranding Study, which demonstrated that changes in river flow during an unplanned outage do not affect water levels in the Holbrook Side Channel, and no stranding of fish or macroinvertebrates was observed. GLHA believes that the Holbrook side channel currently provides effective mitigation for this issue and should be central to any decisions regarding potential future mitigation measures related to planned and unplanned flows from McKay Station"*

The Licensee is gaslighting the stakeholders, agencies, and FERC's compliance and Licensing staffs. The "stranding study" was not designed to determine the status of Bypass Channel juvenile salmon production. In effect, they are turning fantasy into fact; using a negative (no salmonid stranding) to prove juvenile salmon are thriving in the Bypass area. Such statements must be challenged.

The Licensee's Bypass Channel flow statement is absurd and contradicts the laws of physics. As flow in the river is reduced, flow into the bypass channel though submerged pipes must by reduced as it is a function of head (river elevation). And while any change in Bypass flow may not be lethal, it is nevertheless a reduction in aquatic habitat. Continuous flow reductions, often daily, violates Article 406 and its goal of juvenile salmon production. McKay outflows and flows into the Holbrook Bypass are controlled by the Licensee, and any dewatering of this nursery area below the designed McKay Station flow (2500 cfs) is the Licensee's responsibility.

In order for the License's Holbrook Bypass Channel statement be relevant to licensing and compliance issues the following parameters need to be collected:

- The presence or absence of young-of-the-year and parr landlocked salmon must be determined.
- A time series of river flows and corresponding Bypass Channel flows, velocities, and depth measurements.

I urge FERC to disregard the Licensee's unsupported comments regarding "*effective mitigation*" as it relates to the Holbrook Bypass Channel. Article 406

was the cornerstone of the 1996 FERC Licensee and the status of this mitigation measure needs to be determined and then protected in the future.

Thank you for the opportunity to comment on the need to clarify the status of required flows into the Holbrook Bypass Channel and subsequent juvenile salmon production.

Ed Spear

307 Mt Hope Ave
Bangor, Me 04401
Email: edspear1@yahoo.com
Phone: 207-217-4288

CC: Alicia.Jackson@ferc.gov

**TABLE 1**
**Holbrook Side Channel Electrofishing Collections (1991-2002)**

| | Date | Location | Habitat Sampled (sq. yds.) | Species | Fry Or Parr? | Run One Catch | Run Two Catch | Run Three Catch | Run Four Catch | Population Point Estimate | Fish per 100 sq. yd. Habitat Unit | Average Length (mm) | Range in Lengths (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 08/21/2002 | Above Pool | 390 | Salmon | Parr | 14 | 6 | 2 | | 23.4 | 6.0 | 126.9 | 102 - 155 |
| | 08/21/2002 | Above Pool | 390 | Salmon | Fry | 1 | 3 | 2 | | 6.0* | 1.5* | 65.8 | 62 - 71 |
| | 08/21/2002 | Above Pool | 390 | Trout | Fry | 4 | 0 | 0 | | 4.0* | 1.0* | 73.0 | 65 - 77 |
| | 08/21/2002 | Hydraulic Barrier | 333 | Salmon | Parr | 5 | 2 | | | 8.3 | 2.5 | 125.4 | 110 - 137 |
| | 08/21/2002 | Hydraulic Barrier | 333 | Salmon | Fry | 4 | 5 | | | 9.0* | 2.7* | 68.2 | 63 - 74 |
| | 08/21/2002 | Hydraulic Barrier | 333 | Trout | Parr | 1 | 0 | | | 1.0* | 0.3* | 125.0 | 125 |
| | 08/21/2002 | Hydraulic Barrier | 333 | Trout | Fry | 8 | 1 | | | 9.1 | 2.7 | 64.2 | 52 - 73 |
| | 09/19/2001 | Above Pool | 425 | Salmon | Fry | 48 | 37 | 19 | | 143.3 | 33.7 | 71.9 | 58-90 |
| | 09/19/2001 | Above Pool | 425 | Salmon | Parr | 4 | 3 | 1 | | 9.6 | 2.3 | 149.0 | 130 – 172 |
| | 09/19/2001 | Above Pool | 425 | Trout | Fry | 8 | 1 | 3 | | 13.8 | 3.2 | 72.8 | 59 - 93 |
| | 09/12/2001 | Hydraulic Barrier | 302 | Salmon | Fry | 35 | 24 | 16 | 15 | 124.3** | 41.2** | 66.3 | 50-86 |
| | 09/12/2001 | Hydraulic Barrier | 302 | Salmon | Parr | 0 | 3 | 0 | 1 | 4.5** | 1.5** | 141.3 | 135 – 151 |
| | 09/12/2001 | Hydraulic Barrier | 302 | Trout | Fry | 2 | 0 | 1 | 4 | 7.0* | 2.3** | 58.0 | 52 – 61 |
| | 08/18/2000 | Above Pool | 397 | Salmon | Fry | 4 | 4 | 5 | 0 | 21.3** | 5.4** | 71.0 | 60 - 84 |
| | 08/18/2000 | Above Pool | 397 | Salmon | Parr | 2 | 0 | 0 | 0 | 2.0** | 0.5** | 146.0 | 142 - 152 |
| | 08/18/2000 | Above Pool | 397 | Trout | Fry | 4 | 0 | 1 | 0 | 5.3** | 1.3** | 77.6 | 71 - 84 |
| | 08/18/2000 | Above Pool | 397 | Trout | Parr | 1 | 0 | 0 | 0 | 1.0** | 0.3** | 143.0 | 143 |
| | 08/18/2000 | Hydraulic Barrier | 325 | Salmon | Fry | 7 | 1 | | | 8.2 | 2.5 | 69.8 | 56 - 77 |
| | 08/18/2000 | Hydraulic Barrier | 325 | Salmon | Parr | 3 | 1 | | | 4.5 | 1.4 | 137.8 | 129 - 144 |
| | 08/18/2000 | Hydraulic Barrier | 325 | Trout | Fry | 2 | 0 | | | 2.0 | 0.6 | 62.5 | 60 - 65 |
| | 08/27/1999 | Hydraulic Barrier | 325 | Salmon | Fry | 2 | 3 | 6 | | 11.0* | 3.4* | 74.0 | 64 - 84 |
| ^ | 08/27/1999 | Hydraulic Barrier | 325 | Salmon | Parr | 2 | 1 | 0 | | 4.0 | 1.2 | 149.7 | 143 - 155 |
| After | 08/27/1999 | Hydraulic Barrier | 325 | Trout | Fry | 6 | 0 | 0 | | 6.0 | 1.8 | 67.8 | 57 - 83 |
| Improvements | 08/27/1999 | Hydraulic Barrier | 325 | Trout | Parr | 0 | 1 | 0 | | 1.0* | 0.3* | 127.0 | 127 |
| Before | 08/28/1998 | Below Barrier | ? | Trout | Fry | 7 | 5 | | | 24.5 | - | 61.6 | 51 - 76 |
| Improvements | 08/28/1998 | Below Barrier | ? | Trout | Parr | 1 | 0 | | | 1.0 | - | 119.0 | 119 |
| v | 08/28/1998 | Below Barrier | ? | Salmon | Fry | 1 | 0 | | | 1.0 | - | 74.0 | 74 |
| | 09/18/1997 | Below Barrier | 188 | Trout | Fry | 19 | 6 | | | 27.8 | 14.8 | 59.0 | 47 - 88 |
| | 09/18/1997 | Below Barrier | 188 | Salmon | Fry | 1 | 1 | | | 2.0* | 1.1* | 60.5 | 59 - 62 |
| | 10/01/1992 | Run Below Pool | ? | Trout | Fry | 12 | | | | - | - | 70.6 | 56 - 77 |
| | 09/09/1991 | Run Below Pool | ? | Trout | Fry | 23 | | | | - | - | 65.1 | 48 - 82 |
| | 09/09/1991 | Run Below Pool | ? | Trout | Parr | 5 | | | | - | - | 133.2 | 104 - 149 |

* Observed catch used since population estimate was not possible

** First and second runs combined; third and fourth runs combined

UNITED STATES OF AMERICA

FEDERAL ENERGY REGULATORY COMMISSION

| | |
|---|---|
| Great Lakes Hydro America, LLC<br>Application for New License | Ripogenus Hydroelectric Project<br>FERC No. 2572<br><br>Penobscot Mills Hydroelectric Project<br>FERC No. 2458 |

AMERICAN WHITEWATER AND APPALACHIAN MOUNTAIN CLUB COMMENTS ON INITIAL STUDY REPORT AND REQUEST FOR FURTHER STUDY FOR THE RIPOGENUS HYDROELECTRIC PROJECT (P- 2572) AND PENOBSCOT MILLS HYDROELECTRIC PROJECT (P-2458)

American Whitewater and Appalachian Mountain Club ("AW/AMC") submit the following comments and requests for additional study pursuant to 18 CFR section 5.15, in response to the April 22, 2024 filing of the Updated Study Report (ISR) for the Ripogenus Hydroelectric Project and Penobscot Mills Hydroelectric Project (FERC Project Nos. P-2572, P-2458) by Great Lakes Hydro America, LLC ("GLHA"). The licensee held an in-person USR meeting in Bangor, Maine on May 15-16, 2024 in which it provided information on the status of the 20 studies required by FERC's May 13, 2022 Study Plan Determination ("SPD").

On October 8, 2021, AW/AMC filed extensive comments on the pre-application and scoping document, as well as submitting three study requests, to collect information needed to develop an understanding of project operations and their impacts on resources to inform the proceedings and compliance with the National Environmental Policy Act. Specifically, AW/AMC requested the applicant complete the following studies: (1) Recreation Facility Inventory, Recreation Use and Needs Assessment, Aesthetics and Reservoir Surface Area Assessment Study; (2) Controlled-flow Whitewater Boating and Access Study; and, (3) Aesthetics Resources Study. In the Study Plan Determination (SPD), FERC adopted with modifications the study requests of AW/AMC.

AW/AMC filed comments following and a study modification request following the Initial Study Report addressing deficiencies in the filed study reports and requesting additional study addressing the following issues:

- Recreation Study: AW/AMC raised concerns that the study failed to collect sufficient data through focus groups, surveys, and interviews as required by the approved *Recreation Study Plan*. Additionally, the study report did not include certain informal recreation areas, such as trails leading to the water downstream from Ripogenus Dam, and requested that the *Recreation Study* include informal recreation access areas identified by stakeholders. In response to AW/AMC

comments and study modification requests, FERC's study modification determination required that the licensee conduct two focus groups and redeploy survey kiosks to collect additional user survey data, including addressing additional recreation access issues.

- Whitewater Boating Study: AW/AMC sought additional study of whitewater boating opportunities below Ripogenus Dam in the Upper Gorge dryway and below Stone Dam in the Penobscot River dewatered river channel. In response to the AW/AMC study modification request, FERC required Brookfield to conduct a Level 2 whitewater boating study below Stone Dam following the Whittaker, et al. methodology used in whitewater boating studies, stating that a "Whittaker Level 2 study would identify the reach's flow-dependent attributes, assess the feasibility and potential quality of boating opportunities there, and estimate flow ranges by *boating the river*. (emphasis added) FERC approved the modification, in part, requiring the licensee to (1) proceed to a Whittaker Level 2 study for this reach; and (2) explore ways to increase access to this reach with stakeholders and study participants. Based on assertions by the licensee that the inflatable, rubber dam at Stone Dam is not designed to provide consistent and predictable flow releases, staff did not recommend a Level 3 study for this reach, nor additional study in the Upper Gorge, Millinocket Stream, or below McKay Station.
- Aesthetic Study: The licensee's Aesthetic Study Report was not conducted according to the Study Plan Determination in that the licensee failed to consult with Maine BPL, AW/AMC, the Camp Associations, and other interested stakeholders. Instead, the licensee completed the study using only its own paid, biased consultants to evaluate the effect of project operations on aesthetic resources. FERC required the licensee to complete the Aesthetics Study according to the study plan detemination.
- Environmental Justice: AW/AMC raised concerns that the study area was overly narrow and that the study failed to address project effects on the Penobscot Indian Nation, other indigenous groups, and individuals. Additionally, the study failed to examine project-related effects associated with current operations. In response to these comments, FERC expanded the study area to a 5-mile radius and required consultation with the Penobscot Indian Nation. FERC, however, did not address concerns raised by AW/AMC regarding the effects of current operations on affected groups.

AW/AMC incorporate by reference our comments filed in response to the Initial Study Report and file these additional comments in response to the licensee's Updated Study Report and Updated Study Report Meeting.

## Comments on the Updated Study Report

1. Operations Model

The licensee has not completed operations model runs requested by stakeholder groups, has only agreed to run only a subset of the requested model runs, and has unnecessarily delayed the completion of this study. The licensee has not provided a detailed explanation of its basis for rejecting some proposed model run scenarios. As such, we regard the operations model as an iterative process and expect that the initial model runs will lead to further refinements that will assist the FERC staff in evaluating alternative operating scenarios as part of its NEPA analysis. Due to the delay in completing these model runs and subsequent revisions, stakeholders will be unable to adequately respond to the licensee's Draft License Application by the August 1st deadline. Stakeholders reserve the right to file additional comments on this study once the licensee completes the requested model runs and any subsequent refinements.

2. USGS Gage Suitability

The licensee's USGS Gage Suitability Study demonstrates the need for additional USGS gages that would enhance public safety and recreational use in impoundment lakes and downstream river reaches at the Ripogenus and Penobscot Mills developments. Notwithstanding these study results, GLHA proposes no additional PM&E measures in its study reports or Draft License Application. Inasmuch as relicensing studies are conducted to allow FERC to complete its NEPA review of environmental impacts and to develop the best adapted plan for the waterway, GLHA cannot simply ignore study results and should propose additional USGS gages and other flow and impoundment reporting to address public safety and recreation use. Specifically, we recommend that GLHA expand its use of the Safe Waters website to report on impoundment levels in waters affected by its hydropeaking operations to inform recreational boater access. Additionally, Safe Waters should report flow levels below Ripogenus Dam in the Upper Gorge Dryway, below Stone Dam in the dewatered West Branch, and below Millinocket Lake dam in Millinocket Stream to provide flow information in the dewatered and impaired river reaches to protect the safety and recreational opportunities of downstream paddlers and anglers. We also recommend that the licensee install additional USGS gages between McKay Station and Big Eddy as well as above the Penobscot Mills project that would inform downstream boaters and anglers of current flow conditions. Our understanding from the USR meeting that the installation of the new USGS will require spanning the river with a cable above the river in a frequently used whitewater boating section requiring that the cable will be installed so as not to adversely impact or create a safety hazard affecting whitewater boating use.

3. Water Quality

GLHA conducted a study assessing water quality below Stone Dam where leakage flows from flashboards range from 17-189 cfs. The study results do not address how the lack of an adequate minimum flow below Stone Dam affects water quality including dissolved oxygen and water

temperature at the lowest flows that fail to even fully cover the river bed and create disconnected pools in places. Despite these limitations, the study results do demonstrate that the West Branch below Stone Dam provides high quality water maintaining the structure and function of the biological community and capable of supporting aquatic life and the restoration of fish species including macroinvertebrates. This study should address how providing adequate minimum flows will further benefit water quality.

4. Angler Flow Evaluation

This study evaluated angling opportunities below on the West Branch below Stone Dam at various flows. This study failed to follow the approved study methodology in that the highest flow evaluated was 392 cfs rather than flows of 420 cfs, 700 cfs, and 1000 cfs as required by the approved study plan. Additionally, the study arbitrarily utilized short casting distances and fixed wading points not typically reflecting experienced anglers and drawing unsupported conclusions about optimal angling flows. GLHA released water into the West Branch below Stone Dam by reducing generation to raise the pool at Quakish Lake and then overtopping the flashboards. GLHA also has the capability to release flows through partial deflation of its inflatable bladder gate that maintains pond level control. GLHA falsely asserts that it lacks the capability of controlling flows through the inflatable bladder gate; however, this assertion is contrary to claims it made in its application for certification to the Low-Impact Hydropower Institute, attached to this filing.[1] We recommend that the licensee repeat the study following the approved methodology and coordinate with Trout Unlimited on the implementation of the study plan.

5. North Twin Impoundment Tributary Access Survey

No comments

6. Upstream Eel Passage Assessment Study

No comments.

7. Recreation

The licensee conducted a second season of the Recreation Study. As discussed in the USR Meeting, the study report should be revised to include results from the 87 surveys collected from non-project recreation sites. Additionally, the report should include an Appendix with the survey forms including any narrative comments provided by respondents. We are also concerned that the study report fails to make specific recommendations for necessary improvements to recreation facilities based on the study results and no such recreation improvements are included in the Draft License Application. Regrettably, GLHA completely ignores the study results that

[1] https://lowimpacthydro.org/wp-content/uploads/2020/07/20190603-Initial-LIHI-Application-Millinocket-Dolby.pdf at p.29.

are intended to inform FERC's NEPA analysis and inform the development of appropriate PM&E measures that address project effects on recreational resources including adequate parking and river access. We also recommend that this study be read in conjunction with the operations model study, angler flow study, whitewater boating study, and the USGS gage study as these studies and potentially others are intended to address project effects on recreational resources. Based on these study results, GLHA should develop a Recreation Management Plan after consultation with stakeholder recreation groups and resource agencies that proposes specific measures that will be implemented post-license addressing issues identified in the relicensing studies. The issues addressed in the plan should include flow and impoundment level notification, safety signage, parking, sanitation, recreation flow releases, and improvements to access in impoundments, bypassed reaches in the Upper Gorge, Stone Dam, and Millinocket Stream, and riverine reaches affected by project operations.

8. Whitewater Boating

In response to AW/AMC study modification request, FERC required that GLHA conduct a Level 2 whitewater boating study below Stone Dam following the Whittaker study methodology to assess the whitewater boating potential of this dewatered section of the West Branch. The Study Modification Determination stated the following:

> A Whittaker Level 2 study would identify the reach's flow-dependent attributes, assess the feasibility and potential quality of boating opportunities there, and ***estimate flow ranges by boating the river***. Due to the location of this reach near Millinocket and the lack of a sufficient number of interviews to determine potential boating opportunities, we recommend that GLHA: (1) proceed to a Whittaker Level 2 study for this reach; and (2) explore ways to increase access to this reach with stakeholders and study participants. This information should be included in an updated *Whitewater Boating Assessment Report* and filed with the USR… (emphasis added)

Notwithstanding FERC's Study Modification Determination, GLHA has not completed the Level 2 whitewater boating evaluation below Stone Dam and has yet to hold a planning meeting with AW/AMC to coordinate the study implementation. Even more concerning, the licensee's consultant made clear at the USR Meeting that it does not intend to conduct this study according the Study Modification Determination or the Whittaker methodology.

According to *Flows and Recreation: A Guide to Studies for River Professionals (2005)*, there are three levels to a whitewater boating study: 1) Desktop analysis; 2) Single flow feasibility assessment; and 3) Multiple flow assessment. In the Level 1 assessment, the licensee generally collects existing information on whitewater boating use including published materials and analyzes hydrological data on the availability of flows. In a Level 2 assessment, the licensee works with an expert panel of boaters to identify a target flow and conducts and on-land and on-water assessment of a single flow to determine boatable flows. In a Level 3 assessment, multiple flows are evaluated to more precisely identify minimum acceptable and optimal flows using

single flow and comparative flow assessment forms. At each level, there are off-ramps where additional study is unnecessary for various reasons. Unfortunately, FERC's study plan determination has segmented this process into multiple study phases resulting in unnecessary delay.

At the USR Meeting, GLHA stated that it only intended to conduct an on-land feasibility assessment using a single flow, leakage from the flashboard that range from 17-189 cfs, for its Level 2 study. This approach is contrary to the Whittaker Level 2 methodology and will fail to inform the study results in any meaningful way. Viewing a largely dewatered river reach from the shoreline may be appropriate for a Level 1 study by providing photo documentation of existing conditions, but it will fail to provide information on the potential opportunities for whitewater boating under other modes of operation. Target flows should be determined in coordination with the study group based on existing information, not unilaterally by a licensee intent on avoiding responsibility for the impact of its operations on recreational use and enjoyment. Beyond the issue of target flows, the utility on an on-land assessment is limited, as recognized in the Whittaker methodology as follows:

> **Cautions & limitations** On-land boating assessments may suggest whether a river is boatable, but they are unlikely to provide precise assessments of flow ranges. They are helpful for assessing safety issues for an on-water assessment and narrowing flow ranges for additional study, particularly on more challenging (higher gradient) rivers.

While we do not object to an on-land assessment of a single flow, we believe a flow release of 2000 cfs rather than a leakage flow of 17-189 cfs will potentially provide some information, although we expect it is unlikely to provide precise assessment of minimum acceptable and optimal flow ranges. Inasmuch as there is evidence of prior boating on this river reach and the safety concern primarily at Grand Falls is known and the area is easily scouted, an on-water assessment is appropriate for the Level 2 study phase. An on-water assessment is also consistent with FERC's Study Modification Determination requiring that the study "***estimate flow ranges by boating the river.***"

Although the licensee claims that its rubber dam at Stone Dam is not designed to provide consistent and predictable flow releases, it states in its Draft License Application as follows:

> The 428-foot, 5-inch-long spillway section between the waste gate and gatehouse which previously had wooden flashboards, has been retrofitted with a 2-foot, 9-inch-high, single span, Bridgestone rubber dam system. The system is comprised of one airtight dam fastened to the upstream edge of the spillway using a special clamping system. Air is supplied to the rubber dam for inflation through a fitting in the abutment of the dam that is connected to two high-capacity air blowers. Inflation or deflation of the rubber dam may be done in one of two modes: Manual or Automatic. Remote monitoring and control from Brookfield's National System Control Center (NSCC) is the normal mode of operation. Instead of gate operation, the NSCC operator remotely inflates or deflates the

rubber dam to pass the appropriate flows. Flows from the dam enter the 4.5-mile-long Back Channel before flowing into Shad Pond.

Additionally, GLHA's asserts in its application to the Low-Impact Hydropower Institute for certification that it has the ability to release controlled flows below Stone Dam in the event of an outage at Millinocket, as follows:

> Whenever abnormal conditions occur such that a flow cannot be passed through the generators at the Millinocket Powerhouse to achieve the 2,000 cfs minimum flow, the inflatable rubber flashboard system shall be deflated to release flows in an expeditious effort to minimize downriver effects on water quality and aquatic habitat. Except for the initial 2-minute siren warning and a safety flow of 200 cfs for 15 minutes, such flows will not be ramped. The protection of downriver water quality and aquatic habitat is a higher priority than prevention of channel scouring and destruction of vegetation in the Back Channel. During periods of high seasonal flows, the initial 2-minute siren warning and safety flow of 200 cfs for 15 minutes will also be used. Following this 15-minute release, increases of 400 cfs per hour will be made until either the required flow is met, the elevation at Stone Dam is less than 459.45 feet, or the inflatable rubber flashboard system is fully deflated, if necessary. The ramping up of seasonal flows in the Back Channel will be done only after the hydraulic capacity of those units available has been attained."[2]

GLHA's self-serving obfuscation of its capability for releasing target flows below Stone Dam from its rubber dam fails to obscure its transparent attempt to avoid completing this study and assessing projects effects on whitewater boating opportunity on this dewatered section of the West Branch of the Penobscot River. GLHA should proceed to complete this study in accordance with the study medication determination and approved methosolgy.

9. Aesthetics

GLHA's aesthetics study fails to adequately assess the effect of project facilities and operations on aesthetic resources. For example, the study methodology evaluated reservoir levels on two randomly selected days rather than systematically comparing the effects of impoundment fluctuations at maximum and minimum elevations using the same group of study participants. In the first evaluation, GLHA used its paid consultants as evaluators introducing an element of bias into the study results. Subsequent evaluations by stakeholders provided some balance, but the lack of comparative flow conditions at different impoundment levels as well as the lack of comparative flows below Ripogenus Dam obscures the true effects of GLHA's flow alteration. Additionally, GLHA used only a single KOP in the Upper Gorge and did not include photographs or views from other KOPs. GLHA's rational that there are limited views from the Upper Gorge Trail endeavors to use its own failure to provide

[2] https://lowimpacthydro.org/wp-content/uploads/2020/07/20190603-Initial-LIHI-Application-Millinocket-Dolby.pdf at p.29.

access into the Upper Gorge as a basis for omitting an assessment of the effects of its flow diversion and dewatering of the river on aesthetic enjoyment. Additionally, the study fails to compare aesthetic views of the Upper Gorge under various flow conditions. Stakeholders at the USR Meeting expressed that they have additional photos and videos that should be added as an appendix to the study report and that the licensee should set up a Dropbox or other data sharing location that stakeholders can upload additional video. AW/AMC support that request.

10. Terrestrial, Wildlife, and Botanical Resources

No comments

11. Riparian and Littoral Habitat Assessment

No comments

12. Marsh Bird Survey

No comments

13. Furbearer

No comments

14. Wood Turtle Habitat and Presence

No comments

15. Environmental Justice

GLHA's Environmental Justice study was limited to the effects of any proposed construction activities on Environmental Justice target populations within a 5-mile radius of the project. Inasmuch as no construction activities were being proposed, the study found no adverse effects from dust, noise, traffic, siting, etc on disadvantaged communities. While this analysis is useful, it fails to present a complete picture of potential project impacts because it ignores ongoing project operations. While we appreciate that FERC's environmental justice methodology is a work in progress, we believe that this analysis should not only include an analysis of impacts on those residing within a specified radius but also the impact on the wider community including Tribal members and vulnerable populations that utilize project waters for subsistence fishing, recreational enjoyment, and traditional cultural uses and/or artifacts. We encourage GLHA to continue outreach efforts with the Penobscot Indian Nation and other Tribal representatives during the relicensing process.

## Conclusion

We respectfully request that the licensee for the Ripogenus Hydroelectric Project and the Penobscot Mills Hydroelectric Project update the draft studies incorporating the feedback provided in these comments and complete continuing studies consistent with the approved SPD methodology or to continue to further study where study goals and objectives have not been achieved. Completing these studies as described herein by AW/AMC will provide FERC with additional information to complete its NEPA analysis of project impacts to determine appropriate license conditions that are protective of envitonmental values and mitigate project impacts. Thank you for considering these comments.

Respectfully submitted this ___ day of June, 2024

Very truly yours,






Bob Nasdor
Northeast Stewardship and Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776
(617)-584-4566
bob@americanwhitewater.org

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
100 Illick's Mill Rd.
Bethlehem, PA 18017
(610)-868-6915
mzakutansky@outdoors.org

June 24, 2024

Debbie-Anne A. Reese, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject: Ripogenus Hydroelectric Project (FERC No. 2572-133) Updated Study Report comments.**

Dear Secretary Reese,

The following comments on the Updated Study Report (USR) for Ripogenus Project (P-2572-133) are submitted on behalf of members of the Caribou Chesuncook Lake Camp Association, the Chesuncook Dam Camp Association and the Chesuncook Village Association. These associations represent individuals with a significant investment in time, treasure and commitment to Chesuncook, Caribou and Ripogenus Lakes. Many multigenerational families are part of this stakeholder group. We have extensive experience with, and knowledge of the lakes. Our stakeholder group also includes members of the Maine Wilderness Guides Association, fishing guides, commercial guiding businesses, and other recreational users of the lakes. I have been involved in the ILP since the initial PAD was presented and I, or my wife, have attended every possible stakeholder meeting. This involvement, enhanced by our vast experience as Recreational and Whitewater Guides on project lakes and rivers beginning in the early 1980's, deepens our understanding of the project, the process, and the multiple users and stakeholder groups. Like many in our stakeholder group, I have seen numerous changes in the aesthetics and recreational use of the project in recent years. I will be commenting on the operations that impact these changes and on the Second Year Recreation and Aesthetics Studies.

## The Lakes Above Ripogenus Dam - a highly valued resource of the State of Maine

To understand the recreational and aesthetics impact of project operations one must understand the value of the lakes to the people of Maine. All the lakes, rivers and streams within the project are beautiful and, like Chesuncook Lake, offer multiple, high quality recreational opportunities. The State of Maine Land Use Planning Commission rates Chesuncook and Ripogenus Lakes as Class 2. Management Class 2 lakes are high value, accessible, undeveloped lakes. The Commission conserves the special values of these lakes by significantly restricting the density and intensity of development to one development unit per mile of shoreline. A large portion of Chesuncook Lake is also within a Conservation Easement. Other lakes within the project are Management Class 4, 3 or 1. Management Class 4 lakes are high value, developed lakes, Class 3 lakes are identified as potentially suitable for development. Class 1 lakes share characteristics of Class 2 lakes, except they are less accessible. Chesuncook is unique. It is of highest value, developed mainly on the north and south shores with future development limited, and yet is still

accessible. Further demonstrating the lake's status as a valued fishing, boating and canoeing destination, Maine statute prohibits jet skis from Chesuncook, Caribou and Ripogenus lakes. These lakes are remote, wilderness gems.

Chesuncook Lake's remoteness and undeveloped nature is what makes it so important to the state of Maine. So valued that the State of Maine employs a full-time Lake Ranger, May through October to monitor and maintain the public campsites on Chesuncook Lake, including Umbazookus and Gero Island. This ranger assists the numerous public, private and commercial canoe campers, recreational boaters and fishermen and women who use the lake including Bowdoin College, Colby College, Outward Bound, the Sierra Club, the LL Bean Discovery Program, and numerous private fishing and canoe camps and outfitters.

The lake is steeped in history. The Wabinaki–Thoreau Canoe Trail, a 200 mile network of paddling and hiking routes once used by Henry David Thoreau and members of the Wabinaki Nations, passes through Chesuncook Lake. The lake also hosts the Northern Forest Canoe Trail. This 700 mile trail is the longest water trail in the nation spanning New York to Maine on traditional routes used by Indigenous peoples, settlers and guides.

The pristine beauty of Chesuncook Lake attracts recreational users today to the remote campsites and the developments at the north and south end. At the north end of the lake lies Chesuncook Village. A bustling community with an active church and museum, and a large, quintessential, iconic lodging facility. Just across from the village, is Gero Island, a state Ecological Preserve within public reserved lands, one of only 17 in the state within the Maine Natural Resources Program, hosting 5 of the State of Maine's public campsites.

On the southern end of the lake sits the Chesuncook Dam Village which holds the Chesuncook Lake Boom House Museum honoring the logging history of the area, and hosting over 600 visitors yearly, a commercial fishing and hunting business, many private cottages and is the take-out point for the famous West Branch canoe trip as well as the launching point for lake adventures. Multiple private camps dot the shoreline between the north and south shores.

Numerous private camps line the west shore of Caribou Lake and join a large neighborhood of private camps on the east shore. On a summer day one will see recreationists canoeing, kayaking, motor boating and fishing. Winter brings adventurers snowmobiling, ice fishing and Nordic skiing. The lakes are always alive with those savoring the beauty and recreational opportunities the lakes offer.

The previous licensee understood the recreational value and use of the lakes north of Ripogenus Dam and managed the lakes in a balanced manner with an average drawdown "*during the recreation season from 1972 to 1985 was 3.45 ft. The maximum drawdown of the impoundment during the recreation season for the period of record was 15.25 ft in 1980, an extreme low water year when the impoundment began the season 11.4 ft below the normal high-water elevation.*"

There is also immense economic value to the lakes. A recent study by the University of Maine reveals Maine lake's economic value at a staggering 14 billion. The Bureau of Economic Analysis found Maine is the third most heavily involved state in the recreation industry. The report credits Maine's world-class outdoor recreational assets and predicts Maine's outdoor companies who are innovative and sustainable have "great potential for future growth." A study of outdoor recreation in rural Maine found a potential for doubling the industry in the next ten years, from $2.3 billion in 2017 to $5.6 billion in 2030. Outdoor research also shows that access to the outdoors is a major element in recruiting talent." Outdoor recreation encompassed 4% of the state gross domestic product in 2022. As explained by Jenny Kordick, the executive director of Maine Outdoor Brands, "Outdoor recreation isn't just a pastime; it's the heartbeat of our state's economy." The Piscataquis County Economic Development Council believes in the potential of the region as well and identifies Chesuncook Lake as "one of Maine's recreational highlights."

The recreational value of Chesuncook, Caribou and Ripogenus lakes cannot be overstated. The Maine Department of Agriculture, Conservation and Forestry, in a 2004 policy on FERC hydropower project licensing, directed the Bureau of Parks and Lands "*engagement to be focused on 1) public recreational facilities and access, 2) adequacy of flow releases for boating, and 3) the effect of the project on public lands. The primary concern of the Bureau is to avoid or reduce the adverse impacts of continued, increased or fluctuating impoundment levels and downstream flows on public access, wildlife habitat, forest resources, aesthetic resources, recreational facilities, and public trust rights on these lands."* These lakes matter to the people of the state of Maine. As one of the user survey respondents stated, "*I love any recreational experience I have on Chesuncook Lake. It is an invaluable natural resource to the state of Maine because of its remoteness and beauty. I have been coming to Chesuncook Lake many times a year for the past twenty years, and it's a lake I plan to return to for the rest of my life. It's one of my favorite places in Maine to motorboat, kayak, canoe, paddleboard, and swim in the summer."*

The images below demonstrate the impact of project operations on recreationists, boaters, fishermen and those using remote camping sites cared for by the Maine Bureau of Parks and Lands that were not captured in the study reports. The **safety of campers** as well as the **limited access** are quite apparent.

**Near Cardesa Point BPL campsite at near full lake and again at low water**





**The access between Chesuncook and Caribou Lakes at near full lake and at low water.** Look closely at the second picture where you will see a canoe trying to navigate the narrow channel. The canoeists eventually had to walk their boat. Motorboats could not pass.





**Mouser Island, one of the most heavily used BPL sites on the lake, at high water and at low water.** The rocky shoreline makes walking extremely dangerous and limits access.





**SANDY POINT CAMPSITE, POPULAR WITH MOTORBOATS AND CANOES HIGH AND LOW WATER**





**Looking at the famed Gero Island, part of the Northern Forest Canoe Trail, the Wabinaki-Thoreau Trail, and an Ecological Preserve at high and low water**





One can see from the above images, project operations limit **safe access** to Bureau of Parks and Lands campsites, **threaten the safety** of those recreating, and diminish **the aesthetic value** of the lakes.

## Recreational Study Comments

### User Survey comments

Note: At the USR meeting May 15 and 16, 2024 it was requested omitted surveys be summarized and shared. This request was not included in the Study Summary Notes submitted by Brookfield.

- **All completed surveys are not included in the User Survey Reports.** On page L38 of the Recreation Study we are informed *"A total of 87 surveys were completed for non-Project recreation sites (i.e., Chesuncook Lake Remote Campsites, Big Eddy, Gero Island, Chesuncook Village, private camps). Additionally, there were 10 surveys collected that could not be attributed to a specific recreation site.* ***Results from these 97 surveys are not included in this report."***

There are multiple reasons the above statement is incorrect and why all surveys should be included in the study report.

1. Chesuncook Lake Remote Campsites, Gero Island, Graveyard Point at Chesuncook Village**) are cited as FERC Approved Recreation Sites** for the Ripogenus Project in the first Recreation Study (Appendix P-165 and chart below).

**Table 5.8-1**
**Formal FERC-Approved Project Recreation Sites at the Ripogenus Project**

| Recreation Site Name | Development/Location | Recreation Facilities | Notes |
|---|---|---|---|
| Caribou Lake Put-in | Ripogenus impoundment: Western Shore of Caribou Lake basin on the Golden Road | • Primitive gravel boat put in | Managed by GLHA |
| Chesuncook Dam Point Boat Launch | Ripogenus impoundment (Chesuncook Lake basin) on Chesuncook Lake Road off the Golden Road | • Single lane gravel boat launch.<br>• Parking for multiple trailered vehicles<br>• Informational kiosk<br>• Restroom | Managed by Penobscot River Corridor |
| Chesuncook Lake Remote Campsites | Ripogenus impoundment: 10 campsites at various locations around Chesuncook Lake | • Cleared tent site<br>• Fire pit (at some) | Managed by Penobscot River Corridor |
| Umbazooksus Stream Campsites | Ripogenus impoundment: Northeast end of Umbazooksus Cove | • 2 campsites<br>• Cleared tent sites | Managed by North Maine Woods |

The previous applicant also recognized these sites as stated in their 1991 EIS: *"There are 10 remote campsites on Chesuncook Lake, some of which are water access only. These campsites are primarily accessible via boat and are located around Chesuncook Lake and on Gero Island. These sites are managed by the PRC. These campsites are classified as either Authorized or Permitted. Authorized campsites are allowed to have fires without a permit, while the permitted campsites require users to obtain a fire permit from the Maine Forest Service. These campsites are primarily used in the summer months and enable recreational users to camp out on and along the shores of the lake to fish, hunt, swim, and generally recreate within the Project area. There are two other remote campsites further north in Umbazooksus Cove managed by North Maine Woods. These*

*campsites also provide boat access to the northeastern end of Chesuncook Lake and the Upper West Branch, which enters the lake just north of Chesuncook Village."*

2. The survey itself asks respondents in **question 5 about which site** was visited and includes "Chesuncook Lake Remote Campsites (please respond to Question 9)." Question 9 then asks, "Which remote campsite did you visit and how did you access the site?" Not including the results of these questions in the report **misled many respondents** and **leaves a void in understanding the experience** of remote campsite users. These users are typically at sites multiple days, have a deep understanding of the area and directly experience the impact of project operations. Their surveys should be included in the report.
3. **Big Eddy** is not a FERC approved site, but **IS within project boundaries and IS the mecca for fishermen and women**. Big Eddy is **the** meeting place for fishermen and women. These people know the river intimately and understand project operations and their impact on the fisheries.
4. Respondents from camp owners are well within the project boundaries and as has been clearly demonstrated throughout the licensing process, are directly impacted by project operations.
5. **Respondents from Big Eddy and Camp Associations did not know their responses would not be included as the survey never stated that certain responses would not be included.** Question 27 asks "Which recreation site did you visit on this trip today or visit most recently" and includes an option of "Other."
6. The survey also asks, "If you or other members of your immediate family own or lease a camp adjacent to or in the immediate vicinity of any of the Ripogenus or Penobscot Mills Project impoundments, please select which lake the camp is near?" **No indication was given that responses from those who own or lease a camp would not be included in the report.** In fact, when we requested that surveys be mailed directly to camp owners, we were told to just have owners fill out surveys online or from kiosk sites. It should also be noted that in the previous relicensing, surveys were mailed to all camp owners as well as all residents of Millinocket, East Millinocket and Medway.
7. Over 25% of users at the Ripogenus Project Sites reported staying more than 48 hours. These are the remote campsite users. One wonders how much greater this number would be if all surveys were included.
8. GLHA installed survey kiosks at the Umbazooksus West campsite and **the Graveyard Point Boat Launch**, stating, *"The user survey was designed to collect information on group sizes, recreation activities, length of visit, other recreation sites used, crowdedness, user satisfaction, site quality and condition, user opinions, angling, and regional recreation experiences."* **Why were kiosks installed if surveys were not going to be included in the survey results?**

**<u>Summary paragraphs do not always reflect the comments from the surveys.</u>**

Summary paragraphs paint a rosier picture of user satisfaction than user comments indicate.

**Winter Recreation Survey Comments**

The surveys collected over the winter focused on summer experiences: *"In the second-year Recreation Study Plan, GLHA proposed to analyze the surveys collected in the winter separately from the rest of the surveys. In total, 42 surveys were submitted over the winter (December 2022-February 2023, December 2023-February 2024). However, based on responses to open-ended questions, all except one or two surveys were based on recreation experiences in the summer. Thus, GLHA did not analyze the winter surveys separately."* The fact winter survey responses focused on the summer indicates the immense impact of low water levels during the summer recreational season on lake users.

Winter recreation survey results on Chesuncook, Caribou and Ripogenus lakes are not representative of actual use. 42 surveys collected over two winter seasons is a gross under representation of users. Throughout the winter there were no paper surveys available, kiosks were hidden by snowbanks, and QR codes quickly became unusable due to sun fading. The actual use is much greater. A smaller than normal area was plowed this year resulting in no place to turn a trailer around and congested parking along the road. Finally, towards the end of February a privately owned commercial outfitter arranged for a larger area to be plowed. Winter is a busy time on the lakes. I have seen more than 42 people ice fishing in one day, not the reported 42 people in two years! The survey did not capture the true use.

**Recreational Trails:**

What is now called "the Upper Gorge Trail" was never designed as a trail. It was the access road to build and maintain the overland log chute that Great Northern Paper built to sluice logs around the dry section of the West Branch below Ripogenus Dam. It was then used as the river access at Mckay Station for many years. Ripogenus Gorge is one of few gorges in Maine and certainly a spectacular one. As the image below shows, the "trail" is in disrepair and in need of maintenance. Recreational and scenic access to the gorge should be provided with multiple overlooks and river access points. There is only one short section of the log chute remaining. It should be preserved, and signage added to highlight the history of the area. Given that the economy of the area now depends on the recreation economy we need to take advantage of this outstanding natural resource.



## Operations Model Comments

The Operations Model proposed has been discussed at length in meetings and on numerous submissions. As has been supported by others, we would like to emphasize the need for the model **to use 941.6 as full lake in the Ripogenus Lakes with .5 feet up/down for freshet**. This is the established level in all other licensee submissions from the PAD to the USR. The 2000-2023 Operations Data tells us the lake was filled to near 940 feet 70% of the time on May 15th. In the 1991 License Application the applicant states**: "**Between 1972 and 1985 the impoundment was at or near its **normal high water level (El. 941.59') 11 times out of 14 (78% of the time) on Memorial Day**. The previous licensee was able to fill the lake in May, so should the current one. The energy generation claimed in historical operations is based on 941.6 as well.

At the URS meeting Brookfield representatives explained the need to use the 939'as "operational full pond" to prevent flooding and needed extra absorption capacity beyond North Twin due to the larger size of the watershed. Almost all the upstream inflow and that of the extensive storage lakes and ponds is managed by the current operator. The technology and ability to manage flood control is available without starting a recreational season at 939'. Failure to use 941.6 as full lake in the Operations Model risks the accuracy of the model and potentially skews results in multiple ways, including creating an appearance of less energy being produced.

Target elevations of the Operations Model are unrealistic and are not aligned with historical levels as claimed. The Target Elevation for the Ripogenus Development of 928.8' on October 15th is simply an average of elevations on that date the past 10 years, which assumes the past 10 years have been typical operations management. They have not. The actual historical elevation on October 15$^{th}$ has been above 928.8 feet 17 out of the past 22 years.

## Aesthetics Study Comments

The Aesthetics study confirmed what we already knew: The project region is incredibly beautiful and project operations negatively impact the aesthetics of the Chesuncook, Caribou and Ripogenus Lakes. Unfortunately, participants were unable to assess some of the most valued KOP's on the lakes. Despite emails agreeing to use photos and videos submitted by focus group participants as KOP's, at the meetings we were told submitted images would only be included in the report, but not evaluated. As you will see from images below, there is a vast, substantial difference between images submitted by participants, and those given by GLHA.

Although the report states, "*Through a collaborative discussion, it was determined that due to the time of the year and logistics, it would not be safe or practicable to visit and evaluate the "from the water" perspective KOPs, the remote campsite KOPs, or the Caribou Lake Boat Launch."* A collaborative discussion between Focus Group members never took place. Focus Group members were simply told we would not be visiting remote KOP's or observe "on the water" perspectives. There was no collaborative discussion.

The report further claims, *"Instead, GLHA requested that focus group members provide additional photographs or videos of these KOPs to help supplement those gathered as part of the First Year Study."* GLHA representatives refused to allow the focus group to evaluate submitted pictures and videos, which were accurately representative of the "boater's perspective" and "remote campsites" KOP's, "*to identify visual values and develop a baseline rating of the aesthetic value of the views from each KOP."* Instead, we were told we needed to use the "Boater's Perspectives Images" taken by GLHA of the "Most Notable View/Representative View."

The images below, and included videos provide an accurate representation of the lakes from the water, or boater's perspective, as compared to the still images focus group members were required to use. It is easy to see participant images are much more representative of the lakes and capture the "Most Notable View/Representative View."

**Caribou Lake Boater's Perspective Image – be sure to view included videos, which also include views of Katahdin, the largest of the many mountains visible.**



Images provided by GLHA:

**Caribou Lake Boater's Perspective**
Most Notable View/Representative View
North View




6/21/2022 1:16pm North View, Caribou Lake Boater's Perspective9/13/2022



2:30pm North View, Caribou Lake Boater's Perspective

**Chesuncook Lake Boater's Perspective: be sure to view the included video**

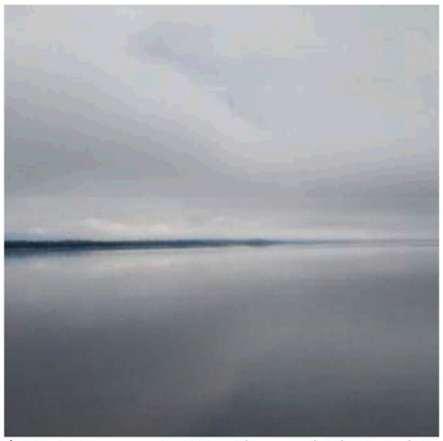


Images provided by GLHA:

**Chesuncook Lake Boater's Perspective**
Most Notable View/ Representative View
North View




6/21/2022 9:05am East View, Chesuncook Lake Boater's Perspective



9/13/2022 9:35am East View, Chesuncook Lake Boater's Perspective

**Ripogenus Lake Boater's Perspective: be sure to view the included video**

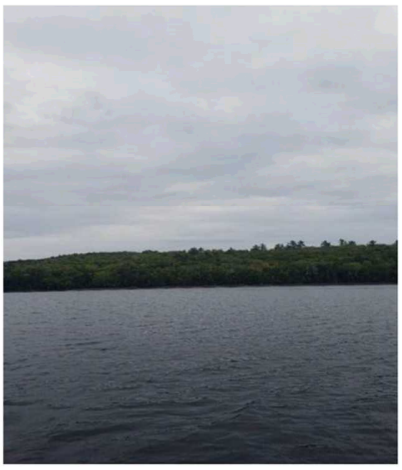


Images provided by GLHA:

**Ripogenus Lake Boater's Perspective**
Most Notable View/Representative View
East View




6/21/2022 2:25pm East View, Ripogenus Lake Boater's Perspective



9/13/2022 3:20pm East View, Ripogenus Lake Boater's Perspective

At the ISR meeting and in ISR comments the need to compare the impact of project operations on project aesthetics was discussed. As part of the focus group participants compared and rated images from spring to fall at specific KOPs. Although the comparison of images clearly demonstrated diminished aesthetic value as the lake levels dropped, the lake level at the time of comparison (approximately 936 feet) was unusually high due to a wet summer and a damaged turbine and does not represent typical fall levels. A level of 936 feet in October has not been seen since 2014.

The pictures below show comparisons from full lake to low water and demonstrate project operations impact on access within and between lakes, aesthetics, boater safety, recreational safety, user enjoyment and user experience. The aesthetic discrepancy is vast.

Videos from a boater's perspective on Chesuncook, Ripogenus and Caribou Lakes are included in this submission. These are the videos we wanted to use for "boater's perspective" KOPs but were not allowed to. They give the observer a complete image of the lakes.

**The south end of Chesuncook Lake at high and low water:**





**The thoroughfare between Ripogenus and Chesuncook lakes from the Chesuncook Dam Site High and Low Water**





**What someone recreating on the lakes experiences at low water:**







Clearly, Recreation and Aesthetics on Chesuncook, Caribou and Ripogenus lakes are significantly impacted by project operations, much more so than the study reports revealed. **Access** to and between lakes **becomes limited and sometimes dangerous,** campers at **public sites** face **unsafe conditions** including having to walk long distances over slippery rocks to access water for drinking, cooking, cleaning and extinguishing fires. These difficulties combined with an unpleasant aesthetic significantly diminish a user's experience.

Maine is nationally known for its beauty and recreational opportunities. Outdoor recreation is a major economic force in the region and promises to become even larger. All the lakes and river stretches in the project must also be managed to protect their aesthetic value and recreational assets. We seek to ensure a strong lake and river fishery, abundant recreational opportunities and secure wildlife habitat through an informed, balanced license. We support other agency and NGO requests that seek to thoroughly and accurately inform the process to create a beneficial license for all stakeholders, including fish and wildlife. We are confident that given an accurate picture of the project today, and an inspired vision for the future, this is possible.

Thank you for the opportunity to submit comments and share our unique stakeholder perspectives. We greatly appreciate the time taken by FERC to read and consider our thoughts.

Sincerely,

Bill Houston

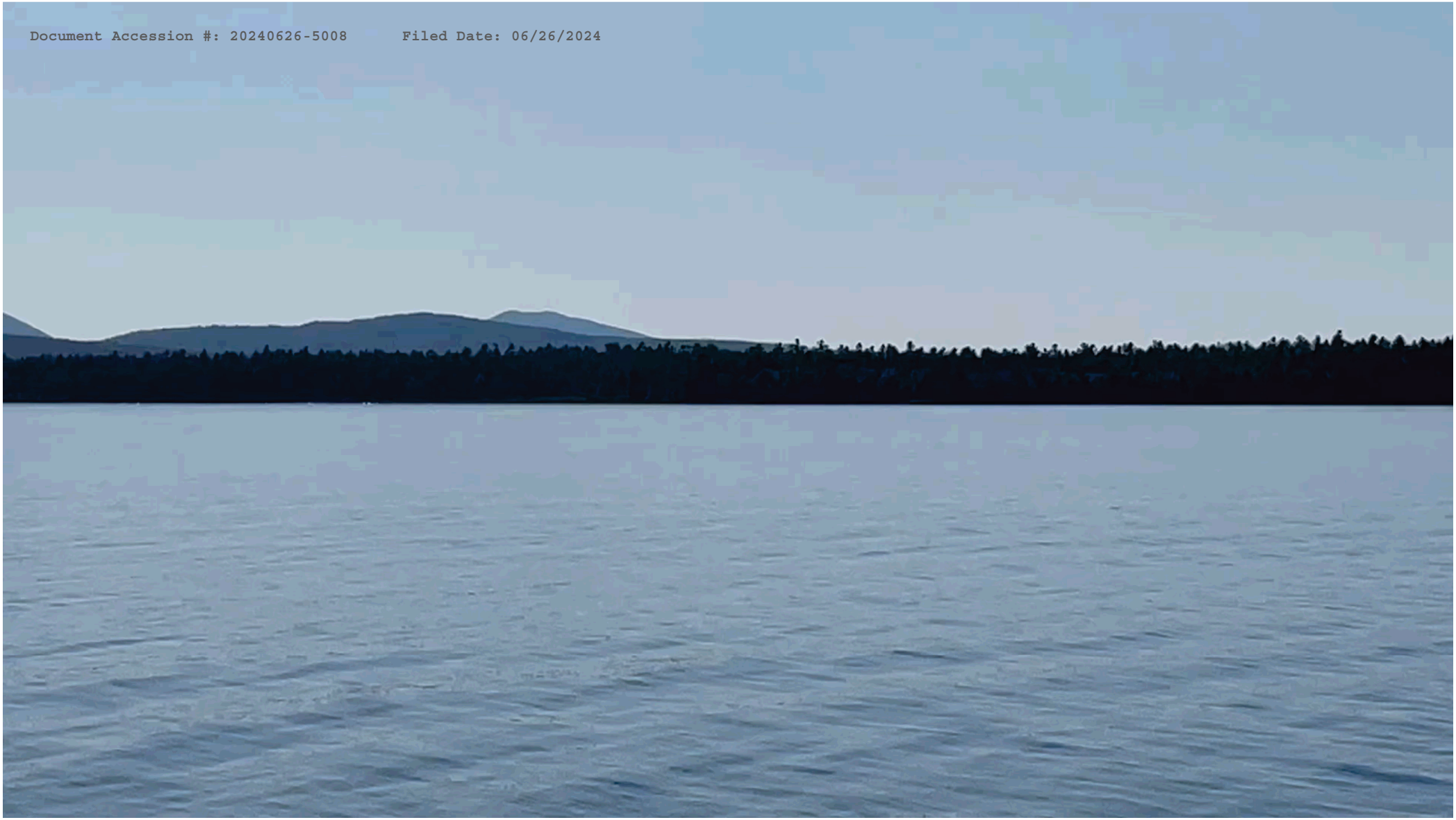
Spokesperson, Caribou and Chesuncook Lake Associations

## From Caribou Lake looking east

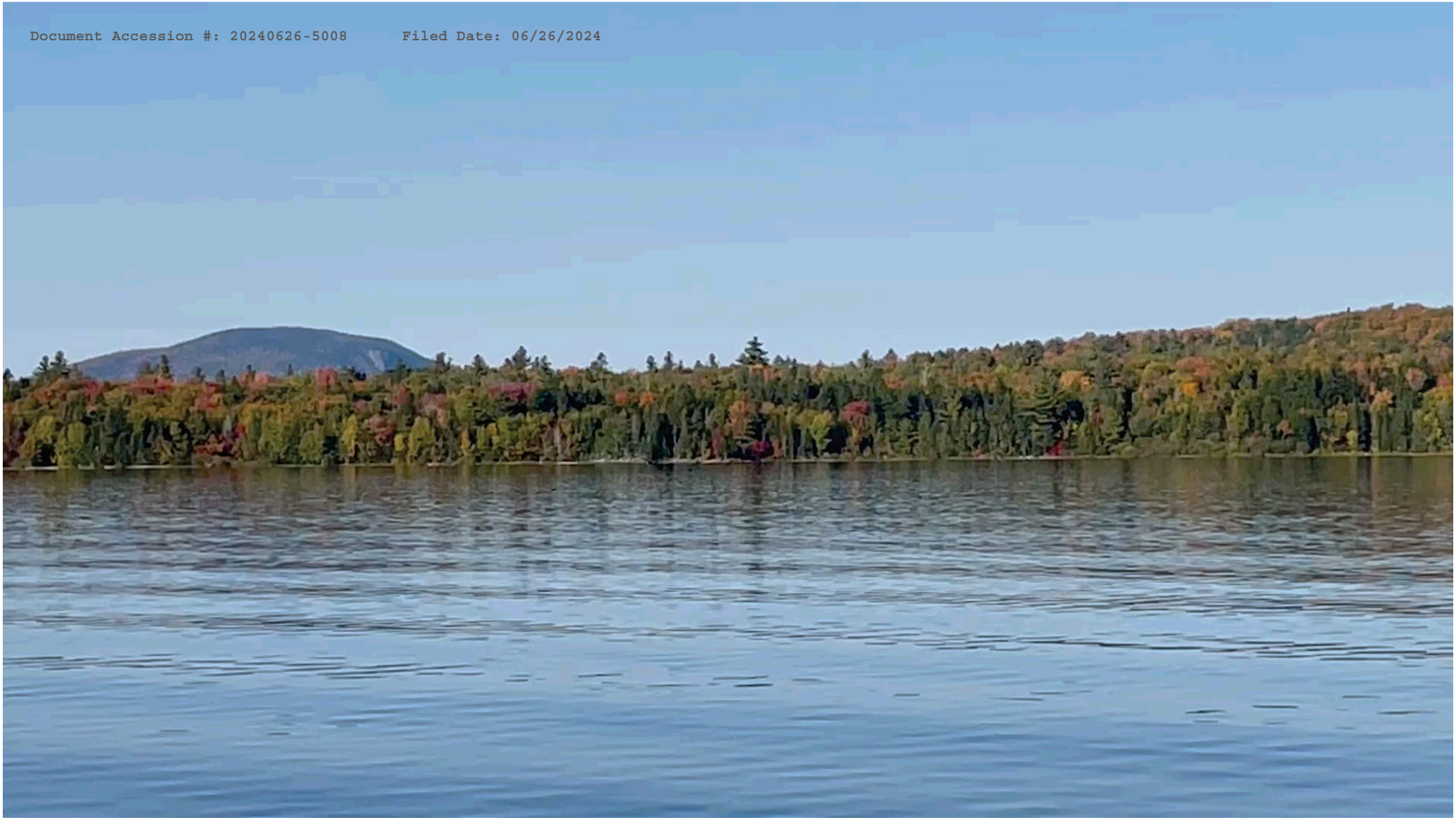


**From Caribou Lake looking south and west**





Document Accession #: 20240626-5008 Filed Date: 06/26/2024



Debbie-Anne A. Reese, Acting Secretary June 26, 2024
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

**Subject: Ripogenus Project, FERC No. 2572; Great Lakes Hydro America's June 21 Response to FERC's** May 24, 2024, Additional Information Request

Dear Secretary Reese Via Electronic Filing

This filing is intended to clarify goals set forth in my July 28, 2023 and February 2, 2024 filings that, in summary, sought to provide additional outage protection to West Branch of the Penobscot River fish and aquatic communities during the relicensing process. Nothing I wrote dealt with maintenance at McKay Station and the need to return McKay Station to operational status. Additionally, as has often been the case, Great Lakes Hydro America (the Licensee) is offering an opinion regarding fish and aquatic communities that is not based on facts. The survivability of salmonid (fish) and aquatic communities as they relate to "travel time" of water is ignored.

The Licensee responded to FERC's May 24, 2024 request on June 21, 2024. In this filing the Licensee's response included "*GLHA does not believe that staffing of the station would appreciably reduce fish mortalities during an outage."* This ignores the facts and simplicity of my request. I made no mention of staffing McKay Station. My suggestion was simply that a person (or persons if safely issues are involved) be sent to Ripogenus Dam possibly using the "Dam Tenders house" when Weather Radar suggest lighting strikes are a possibility. The 500 yard trip from the Dam Tender's house to the Ripogenus Dam gate house and starting the gas generator would have a deep gate open within 15 minutes. Lighting storms are relatively short, this preventive measure would be practical, cheap, and effective.

Furthermore, the Licensee would have the stakeholders, agencies and FERC staff believe that "time saving" is unimportant. The Licensee is ignoring its own data collected in the Stranding Study. While the sudden loss of river flow has major and disastrous impacts on aquatic macroinvertebrates and juvenile fish, impacts occur over time and distance. Fish and aquatic macroinvertebrates

can survive dewatering for several minutes; longer depending on temperature; even longer if the full impact of station outages has not reached downstream habitats. Time matters when emergency West Branch flows are considered.

The Licensee also discusses outage penalty *funds* citing agreements made with Maine Department of Inland Fisheries and Wildlife following the Moose River (P2615) outage. This discussion is largely irrelevant to discussions of short term protection, as any penalty phase would likely be a License article. First and foremost, the goal for McKay Station and the downstream West Branch should be maximizing fish and aquatic communities protection. The suggestion of a “Moose River renumeration model” should only be considered as a last resort. A penalty for each event should be 25 % of the capital cost of the most practical bypass option.

Thank you for the opportunity to clarify/restate my suggestion that would provide fish and aquatic communities additional protection during unplanned McKay Station outages during this relicensing process.

Ed Spear

307 Mt Hope Ave
Bangor, Me 04401
Phone: 207-217-4288
Email: edspear1@yahoo.com

George Forgette, Schuylerville, NY.
Project: P-2572-133

It was 1965 when I was in grad school at Cornell University that I first fished the West Branch of the Penobscot. Our first visit of the West Branch and the fishing was awesome. Everything the fishing magazine article wrote about was true. The West Branch is the gem of rivers east of the Mississippi. You could consistently catch a 3 Â½ - 4-pound salmon on a dry fly, streamer or nymph in 3-4 days of fishing. What an opportunity for a parent to take a child (female or male) who could cast a fly line salmon fishing at only the cost of a license and pitching a tent.

Iâ€™m an 83-year-old retired math and science teacher (grades 7-12) and college with courses in physics, chemistry, biology, and earth science. I am past president of the Adirondack Chapter of Trout Unlimited.

Over the years, my wife and I would see mid to late June swarms of mayflies and/or caddis flies between the Little Eddy and Big Eddy at dusk. On occasion, an osprey would put on a show, diving into the river and get airborne with a 14-inch salmon. From time to time weâ€™d see a family of river otters.

Sadly, much of the latter has disappeared since the year 2003 when Brookfield took over management of the water flow. Brookfield treats the water source like a yo-yo, fluctuating as much as plus or minus 2,000 cfs, based on energy demand. Great Northern, consistently, ran the water from 2600 to 2800 cfs. If there was a problem at the power plant (McKay Station) the water flow was dropping, there was a maintenance staff flying up the road to fix the problem. I timed it one day, about 30 minutes from Millinocket. During station shutdown, all the time water was continually released from the bottom of the dam through Ripogenus Gorge to the Little Eddy and downstream, benefiting the salmon, trout and insect life all year long. Remember the characteristics of water during winter. The top of the lake ice was 0 degrees Celsius, the bottom of the lake 3-4 degrees Celsius warmer than the top. The water release will became more critical in years to come as climatic warming increases, and especially during the summer time.

I no longer see smelt in the river, which was the major source of food for the salmon along with some of the bird life that fed on smelt. A study needs to be done on Ripogenus impoundment as well as the smelt access to their spawning streams and subsequent passage of smelt downstream of McKay station.

I understand that a biologist, contractor to Brookfield, shocked the Big Eddy in May. Of course the contractor would do exactly what Brookfield asked them to do; no more or no less. However, the upstream movement of salmon varies from the first week to the fourth week of June (1991 FERC licensee application). Their report, probably, includes the length and weight of the fish and that they looked healthy. Whereas, if they took scale samples, Brookfield would have much more information about the salmonâ€™s age, growth rate, etc.

Scientific American has several articles in the past 2 y ears about information and disinformation. By not sampling other pools and not getting scale samples, it is bias sampling. I would anticipate Brookfield using the contracted biologistâ€™s report; everything is fine with the salmon and insect life. This is disinformation; the general public would not be aware how they are being misinformed. A good measure of the lack of salmon is a lack of fishermen. The Big Eddy campsite should be full in the third week of June. It is not. This lack of users affects the whole economy of the area, campgrounds, and businesses in Millinocket.

The only way to submit information or comments is by computer online. Itâ€™s a problem for some of us older folks. Please talk to or elicit information from fishermen that have 40 or more years on the river.

The West Branch is a gem of gems river, if properly managed, to be what it once was to everything, it could be to all in the future.

George Forgette
518-695-6055
georgeforgette@gmail.com

JANET T. MILLS
GOVERNOR

STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
353 WATER STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041

JUDITH CAMUSO
COMMISSIONER

***Via Electronic Filing***

June 27, 2024

Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

**Re: MDIFW Comments on the Updated Study Report for the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458)**

Dear Acting Secretary Reese:

The Maine Department of Inland Fisheries and Wildlife (MDIFW) has reviewed Great Lakes Hydro America, LLC's (GLHA, Licensee) Updated Study Report (USR) and associated study reports for the Ripogenus and Penobscot Mills Projects filed April 22, 2024. MDIFW staff also attended the USR Meeting held May 15 and 16, 2024. We provide the following limited comments on the USR below and will provide more thorough comments on the Draft License Application (DLA).

North Twin Impoundment Tributary Access Study Report

The report indicates the Tributary Access Study was conducted on November 6 and 7, 2023, at a water surface elevation level (WSEL) of 489.7 feet. Furthermore, the report states:

> "*Since 2012,[2] Article 408 of the Penobscot Mills Project license has required the North Twin impoundment elevation to be maintained at a relatively stable level from May 1 through August 22 annually and maintained at a minimum target elevation of 488.42 from August 22 through October 15 (i.e., no more than 3.5 feet below the full pond elevation). The license also requires a minimum flow of 3,000 cubic feet per second (cfs) from the North Twin Development from August 22 through October 15, so long as the impoundment elevation exceeds 488.42 feet.* ***From October 15 to the start of the spring freshet, the impoundment elevation is gradually reduced to a lower target elevation of 479.42 (12 feet from the normal full pond elevation) to provide storage for winter thaw and spring inflows.*** *From ice out to August 22, the impoundment is refilled and then maintained at a relatively stable target elevation*."
>
> ***"Daily average water surface elevation (WSEL) data from the North Twin impoundment between 2012 and 2022 show that during the Landlocked Salmon spawning period (October and November), the mean low WSEL was 487.86 feet (4.1 feet below normal full pond elevation), and the median low value was 487.96 feet (4.0 feet below normal full pond elevation)*** *(Table 1-1). The lowest impoundment elevation recorded in this time period*

PHONE: (207) 287-5254 FISH AND WILDLIFE ON THE WEB: www.maine.gov/ifw EMAIL ADDRESS: IFWEnvironmentalreview@maine.gov

> *occurred on November 30, 2019, at 485.37 feet (6.5 feet below normal full pond elevation).* ***The highest impoundment elevation in this period occurred on November 16, 2013, at 489.43 feet*** *(2.5 feet below normal full pond elevation) (Figure 1-1).”* (emphasis added)

*Nahmakanta Stream*

Again, the North Twin Impoundment Tributary Access Study was conducted at an impoundment level of 489.7 feet, or 2.1 feet above the mean low WSEL for the 10-year landlocked salmon spawning period of October and November 2012-2022, and 0.27 foot higher than the highest recorded impoundment elevation for the same period. Tributary access would not be expected to be impeded during these high flows. Table 1-1 (Appendix E, Pg.4) shows the lowest daily average elevation level of the North Twin impoundment between October and November 2012-2022 varied from 485.37 to 489.43, while Figure 5-5 (Appendix E, Pg.18) indicates a bottom elevation contour for the upper reach of the impoundment in Nahmakanta Stream to range from 484-488 feet. Further, Figure 5-6 (Appendix E, Pg.19), Nahmakanta Depth Contours, shows the stream depth in the upper reach to be 2 feet minimum at the WSEL 489.7 feet at the time of survey. Therefore, a WSEL of 489.7, minus 2 feet of water depth, equals 487.7 feet bottom elevation. The study report refers to an accepted zone of passage (ZOP), or minimum depth of water suitable for salmon passage, of 0.5 feet. Adding 0.5 feet to a streambed elevation of 487.7 feet yields a water surface elevation of 488.2 feet as the *minimum* necessary to permit landlocked salmon passage. Applying the lowest daily average WSEL of Table 1-1, the North Twin impoundment appears to have been below the upper stream reach bottom elevation contour ZOP nearly 73% of the years from 2012-2022 during the landlocked salmon spawning period. Low water-surface elevations in Nahmakanta Stream appear to not only block safe, timely, and effective passage of landlocked salmon to spawning habitat, but also expose and prevent the use of valuable spawning substrates.

*Original MDIFW proposed study request*

MDIFW’s originally submitted “*Comprehensive Impoundment Landlocked Salmon Habitat Use/Spawning Study*” in part requested the Licensee to radio tag and track a number of landlocked salmon to: assist in determining seasonal movements and behaviors of landlocked salmon (within and between the five connected lakes), observe any effects of annual Project drawdowns on the movement and behaviors of landlocked salmon in the impoundment, and help identify landlocked salmon spawning areas within the North Twin impoundment and project boundaries.

The telemetry portion of the request was denied and subsequently modified to become the “*North Twin Impoundment Tributary Access Survey*”. The Licensee’s study modification ignores seasonal salmonid movement into, out of, or within the 18,000-acre North Twin impoundment including windswept shoal and shoreline spawning habitats, particularly during fall spawning period. It is MDIFW’s position that the Tributary Access Study, without the recommended telemetry component, has failed to identify salmonid movement or habitat use within the lacustrine shoals and shoreline of the North Twin impoundment. Additionally, any salmon movement into the outlet during the fall spawning period has not been documented. Outlet flows of the North Twin impoundment are controlled by the Project’s North Twin Dam and could have

an effect on spawning timing and success. As was requested for the initial study, radio-tagged salmon could help identify potential salmon movement into the outlet and the efficacy of the North Twin Dam fishway to pass salmon back upstream into the impoundment after spawning.

There is virtually no information on what effects Project seasonal water level fluctuations may have, or may not have, on landlocked salmon life histories, most importantly spawning and rearing potential. Tracking landlocked salmon movements through the use of radio telemetry within the North Twin impoundment would document timing and spawning locations of naturally reared salmon, as well as identify any potential effects of Project operations on spawning behavior. Location of salmonid spawning habitat could potentially help inform fisheries managers whether minimum impoundment levels need to be established in a license renewal to help protect established redds and ensure adequate water levels for incubating eggs and emerging fry.

Terrestrial, Wildlife, and Botanical Resources Study/ Riparian and Littoral Habitat Assessment

Regarding the Cover Type Mapping, the report states that the Projects' boundaries include a total of approximately 71,097 acres, the majority of which (>83%, or approximately 59,011 acres) consists of open water associated with the Projects' impoundments.

*Riparian and Littoral Habitat Assessment Study*

Pertaining to the Riparian and Littoral Habitat Assessment Study, MDIFW wishes to reiterate our recommendations made during the Initial Study Report Meeting, held on May 2, 3, and 4, 2023, and restated during the USR meeting held on May 15 and 16, 2024. These recommendations were not fully captured in the Assessment Study, although some of the wetland concerns were addressed in the subsequent USR Meeting Minutes:

1. Compare the location, size and various wetland cover type delineations from when they were evaluated for the last license (i.e., late 1980's, early 1990's) versus what they look like today.
    a.) Provide a map showing the location of all wetlands within the Project boundary with the different wetland cover types delineated for each wetland, for both time periods.
    b.) Provide a summary table of the number of acres of all the wetlands and each cover type for both time periods.
    c.) Clearly explain the procedures used to determine these wetland comparisons for both time periods.

2. Provide an explanation of how (i.e., timing, procedures) the transmission corridors vegetation is managed. With a better understanding of these procedures, it may be possible to modify the timing and selection of certain tree or shrub species to benefit wildlife without greatly compromising the ability to keep vegetation from contacting the transmission lines. For example, there is a Deer Wintering Area located on the south side of the West Branch in T3R11 WELS. During winter, some deer travel out of this area to the south and across the transmission line to reach quality winter shelter on the other side. Currently, this area has

very short vegetation, like most of the transmission corridor. By allowing the vegetation to grow to a greater height along a section of this portion of the transmission line, it could help deer navigate this area as the snow gets deeper during the worst part of winter.

The routine operations of the Projects (water level drawdowns and fluctuating flow releases) impact the acreage of Open Water habitat as well as associated littoral zones, riparian wetlands, and downstream riparian aquatic habitats, including the varied wildlife species that depend on these habitats for their life history requirements, to varying degrees. These diverse wildlife groups include benthic invertebrates/macroinvertebrates, fishes, amphibians, reptiles, aquatic mammals (e.g. beavers, muskrat) and water-dependent birds (e.g., common loons, breeding and foraging marsh birds, breeding and foraging waterfowl). As indicated in our previous comments, many of the species impacted may include modeled and/or predicted Species of Greatest Conservation Need (SGCN) aquatic or aquatic-associated invertebrate species, as described in Maine's 2015 State Wildlife Action Plan.

| | | |
|---|---|---|
| 1 | *Aeshna juncea* | Sedge Darner |
| 2 | *Alasmidonta undulata* | Triangle Floater |
| 3 | *Alasmidonta varicosa* | Brook Floater |
| 5 | *Ameletus browni* | A Mayfly |
| 6 | *Anodonta implicata* | Alewife Floater |
| 7 | *Baetisca berneri* | A Mayfly |
| 8 | *Baetisca lacustris* | A Mayfly |
| 9 | *Baetisca rubescens* | A Mayfly |
| 10 | *Boloria frigga saga* | Frigga Fritillary |
| 11 | *Cicindela ancocisconensis* | White Mountain Tiger Beetle |
| 12 | *Cicindela marginipennis* | Cobblestone Tiger Beetle |
| 13 | *Enallagma carunculatum* | Tule Bluet |
| 14 | *Enallagma laterale* | New England Bluet |
| 15 | *Enallagma pictum* | Scarlet Bluet |
| 16 | *Epeorus frisoni* | Roaring Brook Mayfly |
| 17 | *Lampsilis cariosa* | Yellow Lampmussel |
| 18 | *Lanthus vernalis* | Southern Pygmy Clubtail |
| 19 | *Leptodea ochracea* | Tidewater Mucket |
| 20 | *Leucorrhinia patricia* | Canada Whiteface |
| 21 | *Lycaena dorcas claytoni* | Clayton's Copper |
| 22 | *Margaritifera margaritifera* | Eastern Pearlshell |
| 23 | *Metretopus borealis* | A Mayfly |
| 24 | *Ophiogomphus colubrinus* | Boreal Snaketail |
| 25 | *Ophiogomphus howei* | Pygmy Snaketail |
| 26 | *Papilio brevicauda gaspeensis* | Short-tailed Swallowtail |
| 27 | *Parameletus midas* | A Mayfly |
| 28 | *Procloeon ozburni* | A Mayfly |
| 29 | *Rhithrogena undulata* | A Mayfly |
| 30 | *Siphlonisca aerodromia* | Tomah Mayfly |
| 31 | *Siphlonurus barbaroides* | A Mayfly |
| 32 | *Siphlonurus barbarus* | A Mayfly |
| 33 | *Siphlonurus demaryi* | A Mayfly |
| 34 | *Siphlonurus securifer* | A Mayfly |

| | | |
|---|---|---|
| 35 | *Somatochlora brevicincta* | Quebec Emerald |
| 36 | *Stagnicola mighelsi* | Bigmouth Pondsnail |
| 37 | *Vertigo paradoxa* | Mystery Vertigo |

Without specific studies to document the presence/absence, abundance, and distribution of one or more of these SGCN species in the Project Areas, it remains unclear how, and to what extent, Project operations may be impacting these species, if present.

MDIFW will be exploring comprehensive Protection, Mitigation, and Enhancements (PME) measures in our review of the DLA.

Marsh Bird Study and Common Loon Assessment

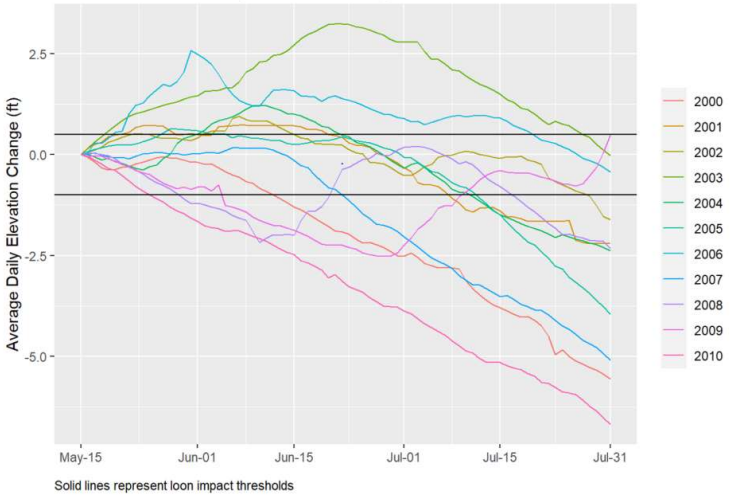
*Marsh Bird Study*

The only target species detected in this assessment was the American bittern, which is designated as a Species of Greatest Conservation Need in Maine's State Wildlife Action Plan. American bitterns prefer hemi-marsh conditions (50:50 ratio of open water interspersed with vegetation), and research has shown that water level fluctuations that reduce the amount of open water cause extinction from a site over time. Likewise, this species prefers to have some deeper water present within the wetlands: they have longer legs than many other marsh birds which allows them to take advantage of deeper sites for feeding. Therefore, fluctuations that reduce water depths could have a negative effect on this species' use of the site. American Bitterns nest May through July, so minimizing drawdowns during this time would be beneficial to this species as well as a suite of other marsh birds, wading birds, and waterfowl species that nest on the ground or close to the water surface.

*Common Loon Assessment*

The Ripogenus Project operates as a store-and-release development with an annual seasonal drawdown that allows for management of water levels and flows downstream of the Ripogenus Project. The normal full pond elevation of the Ripogenus impoundment is 941.59 feet with a maximum drawdown of 44 feet (based on operational limitations of the Project); however, target seasonal drawdown in the spring prior to high inflows is typically not more than 28 feet (913.6). Figure 19 below depicts the water level elevations at the Ripogenus Impoundment between 2000-2010 during the loon breeding season, which is also relevant to resident marsh birds, wading birds, and waterfowl species.

**Figure 19**
**Average Change in Daily Water Surface Elevation by Year in the Ripogenus Impoundment During the Loon Nesting Period, 2000-2010**




MDIFW will be exploring comprehensive Protection, Mitigation, and Enhancements (PME) measures for water-dependent birds, including a more comprehensive Common Loon Management Plan, in our review of the DLA.

Furbearer Study

The goal of the study was to determine if Project operations, namely annual drawdowns, are impacting resident beavers and muskrats at the Ripogenus impoundment. Specifically, the goal of the study was to collect baseline data on muskrats and beavers using the Ripogenus impoundment area *to enable assessment of potential Project-related impacts* (emphasis added) and available habitat. To get at this, the objectives of the study were to:

1. Obtain baseline distributional and habitat presence/absence data and map occurrences of muskrats and beavers within the Ripogenus Project area; and
2. Describe the distribution and relative abundance of muskrat houses, muskrat push-ups, and beaver lodges in various habitat types within the Ripogenus Project area *in relation to changing water levels during the season* (emphasis added)

The Ripogenus Project operates as a store-and-release development with an annual seasonal drawdown that allows for management of water levels and flows downstream of the Ripogenus Project. Normal full pond elevation of the Ripogenus impoundment is 941.59 feet with a maximum drawdown of 44 feet (based on operational limitations of the Project), although the target seasonal drawdown in the spring prior to high inflows is typically not more than 28 feet (913.6).

It should be noted that the study report accurately states that GLHA consulted with MDIFW, and that GLHA also invited MDIFW staff to participate in study efforts, but that MDIFW was unable to participate in the study due to conflicting schedules and limited staff availability. For additional context, Maine experienced unusually high amounts of precipitation in 2023, delaying the study until weather conditions were suitable. By the time a suitable study weather window materialized in October 2023, the Licensee was unable to provide adequate notice to MDIFW for participation (at no fault to the Licensee.)

MDIFW truly appreciates the multi-day effort over sometimes challenging terrain that went into this study, which revealed that beavers and muskrat are utilizing the impoundment and associated wetland habitats, as anticipated. However, while the first objective of the study was achieved, MDIFW does not believe that the second objective, or a major goal of the study (assessment of potential Project-related impacts) was accomplished. This would have been challenging to accomplish given that the precipitation during 2023 resulted in the impoundment remaining at higher-than-normal lake levels during the study period.

The study references two earlier furbearer studies at other hydroelectric projects in the region (Brassua Project, FERC No. 2615 and the Flagstaff Project, FERC No. 2612) that indicated that beavers had adapted well to the winter drawdown at these impoundments based on observations of the utilization of multiple lodges and food caches and the ability to travel safely under the ice to reach both. Specific to muskrat, the Brassua study indicated that while muskrats were able to remain in their dens and utilize under-ice runways to forage, the presence of aquatic vegetation, a preferred food, may have been reduced by lack of suitable substrate and by winter drawdowns. The conclusion of the studies indicated no significant difference between the animals studied at the Brassua and Flagstaff impoundments compared to the natural/non-regulated control lakes.

While MDIFW agrees with the results of those earlier studies, it is unclear if the results can be directly applied to the Ripogenus Project due to differing bathymetry/depths, riparian wetlands, substrate type and composition, and any other variations between the projects, including operations. While the animals at the Flagstaff and Brassua Projects were impacted by respective project operations, it was demonstrated they were able to adapt to those conditions at those locations. Similarly, it stands to reason that beavers and muskrats are being impacted at the Ripogenus Project, but the study was unable to determine if the animals at Ripogenus are similarly able to adapt.

MDIFW will be exploring comprehensive Protection, Mitigation, and Enhancements (PME) measures for furbearers in our review of the DLA.

These are large-scale, remote, and inherently challenging issues to resolve, with oftentimes competing or conflicting interests from other agencies and groups, and MDIFW appreciates the Licensee's ongoing commitment to work through these issues. Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,



John Perry
Environmental Review Coordinator

Cc: Francis Brautigam, Joe Overlock—MDIFW Fisheries Division, Augusta Headquarters
Tim Obrey, Jeff Bagley—MDIFW Fisheries Division, Region E
Kevin Dunham, Kevin Gallant—MDIFW Fisheries Division, Region F
Nathan Webb, Ryan Robicheau—MDIFW Wildlife Division, Augusta Headquarters
Bethany Atkins, MDIFW Habitat Section Supervisor
Phillip deMaynadier, MDIFW Wildlife Diversity Section Supervisor
Danielle D'Auria, Shevenell Webb, Derek Yorks, Beth Swartz—MDIFW Wildlife Diversity Section
Doug Kane, Scott McLellan—MDIFW Wildlife Division, Region E
Mark Caron, Lauren McPherson—MDIFW Wildlife Division, Region F
Casey Clark, MDMR
Laura Paye, MDEP
Jim Vogel, BPL
Kyle Olcott, USFWS
Jeff Murphy, NMFS

Brookfield
Renewable U.S.

June 28, 2024

***Via eFiling***

Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject: Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Updated Study Report Supplement**

Dear Acting Secretary Reese:

Great Lakes Hydro America, LLC (GLHA), the Licensee of the Ripogenus Hydroelectric Project (FERC No. 2572) and the Penobscot Mills Hydroelectric Project (FERC No. 2458) (collectively referred to as the "Projects"), herein files with the Federal Energy Regulatory Commission (FERC) a supplement to the Updated Study Report (USR) for the relicensing of the Projects. The Projects are located on the West Branch Penobscot River and Millinocket Stream in Piscataquis and Penobscot counties, Maine.

On June 11, 2021, GLHA filed the Notices of Intent and a Pre-Application Document, which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through FERC's Integrated Licensing Process (ILP). On April 22, 2024, GLHA filed with FERC the USR, which included study results available at that time.

Since the filing of the USR, additional study results for the Operations Model Study have become available and are provided herein, which consist of the model run results for the requested alternative operating scenarios evaluated by the model.

**GLHA will conduct a virtual meeting with interested stakeholders to explain the operations model run results provided herein. The virtual meeting will occur on Wednesday, July 10, 2024, from 9:00 AM to 2:00 PM. GLHA requests that agencies or stakeholders who plan on attending the virtual meeting RSVP by contacting Cate Russell at Cate.Russell@hdrinc.com or by phone at (207) 239-3792 on or before July 8, 2024.**

In response to stakeholder requests during the USR meeting, GLHA is providing the data in MS Excel format for all of the recreation user surveys that were collected for the Recreation Study in 2022-2024. The MS Excel spreadsheet includes two worksheets: Metadata and Data. The Metadata sheet provides the survey questions, the corresponding variable names in the Data sheet, a description for each variable, and the coding used for the responses. The Data sheet provides the data for all 330 surveys that were collected via the QR code and paper for Project recreation sites, non-Project recreation sites, and unknown recreation sites.

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

Additional study activities associated with the Fish Assemblage Survey, the McKay Station Ramping Study, the Fish Stranding Mitigation Study, the Whitewater Boating Assessment Study, the Water Quality Study (macroinvertebrate sampling), and the Umbazooksus Lake Mitigation Study are ongoing. GLHA will file additional study data associated with the ongoing studies with FERC in another USR Supplement and/or with the Final License Application.

Concurrent with this filing, GLHA is providing a copy of this letter to all parties listed in the attached distribution list. Parties can download an electric copy of this filing from FERC's eLibrary system at https://www.ferc.gov/ferc-online/elibrary by conducting a search using the docket numbers P-2458 and/or P-2572.

If you have any questions regarding this letter, please contact me by phone at (315) 566-0197 or by email at michael.scarzello@brookfieldrenewable.com.

Sincerely,



Michael Scarzello
Manager, Licensing
Brookfield Renewable U.S.

cc: Relicensing Distribution List

Enclosed: Updated Study Report Supplement

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

# Ripogenus Hydroelectric Project (FERC No. 2572)
# Penobscot Mills Hydroelectric Project (FERC No. 2458)
# Pre-Application Document
# Distribution List

**Federal Agencies**

Glori James-Suarez
Realty Specialist
Northeastern States
Bureau of Land Management
250 E. Wisconsin Avenue, STE 1100
Milwaukee, WI 53202

Lori A. Ehrlich
Region 1 Administrator
Region 1
Federal Emergency Management Agency
99 High Street, Sixth Floor
Boston, MA 02110

Paul Ford
Acting Regional Administrator
Region 1
Federal Emergency Management Agency
99 High Street
Boston, MA 02110

Debbie-Anne A. Reese
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
19 West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Ripogenus Hydroelectric Project (FERC No. 2572)
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Distribution List

Maine Project Office
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

Leonard Rawlings
FERC Coordinator
Eastern Region
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Joseph Bishop
Water Division Hydro Coordinator
New England Region
U.S. Environmental Protection Agency
5 Post Office Square
Boston, MA 02109

Karen McGuire
New England Region 1
Deputy Regional Administrator
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Kyle Olcott
Hydropower Coordinator
Maine Field Office
U.S. Fish and Wildlife Service
306 Hatchery Road
East Orland, ME 04431

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

**State Agencies**

Stephen Dickson
State Geologist, Bureau Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

# Ripogenus Hydroelectric Project (FERC No. 2572)
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# Distribution List

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Laura Paye
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Erin Wilson
Coastal Policy Specialist
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

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Distribution List

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Peter Jamieson
Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
40 Western Avenue
E.S. Muskie Federal Building, Room 412
Augusta, ME 04330

Stacey Guerin
State Senator
3 State House Station
Augusta, ME 04333

Kathy Irene Javner
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, Maine 04333

Trey Stewart
State Senator
3 State House Station
Augusta, ME 04333

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Distribution List

James Lee White
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, ME 04333-0002

**Native American Tribes**

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Rena Newell
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

**Additional Parties**

Dr. Andrew Fisk
Northeast Regional Director
American Rivers

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

Ripogenus Hydroelectric Project (FERC No. 2572)
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Distribution List

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Jesika Lucarelli
Great Mountain Guide Service

Mark Nadeau
International Association of Machinists
245 Pamola Park
Millinocket, ME 04462

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

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Distribution List

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Arthur Dickey
Maine Rafting Expeditions

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing

Matt Polstein
New England Outdoor Center

Jim Murton
North Country Rivers

Jeremy Hargreaves
Northeast Whitewater

Derek Heady
Northeast Whitewater

Suzie Hockmeyer
Co-founder
Northern Outdoors, Inc.
1771 US Rt 201
The Forks, ME 04985

Emily Yearwood
Northern Outdoors, Inc.
1771 US Rt 201
The Forks, ME 04985

Michael Smith
Outdoor Sport Institute
176 Highland Ave
Millinocket, ME 04462

Kenny DeCoster
Vice President
Penobscot Paddle and Chowder Society

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Amanda Williams
Representative for Allagash Gateway Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
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Distribution List

Tom Tyler
President
Sportsman's Alliance of Maine
205 Church Hill Road
Augusta, ME 04330

Jimmy Doria
Three Rivers Whitewater

Neil Hagstrom
Trout Unlimited

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,

Dean Beaupain

Jeff Fayle

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

Peter Forti

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Christopher Howe

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Charles Paone

Richard Parkes

Edward Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Robert Van Deventer

Filed via "eFiling"

June 28, 2024

Ms. Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Division
888 First Street, N.E.
Washington, D.C. 20426

**RE: Comment on Updated Study Report and Updated Study Report Meeting Summary, Ripogenus Project (FERC No. 2572) and Penobscot Mills Project (FERC No. 2458)**

Dear Acting Secretary Reese,

These comments are in response to the Updated Study Report (USR), submitted to FERC on April 21, 2024, and the Updated Study Report Meeting Summary, submitted to FERC on May 31, 2024, by Great Lake Hydro America, LLC (GLHA). The Bureau has been an active participant in the combined Integrated Relicensing Process (ILP) for these Projects, providing input to the development of the study plans for the Recreation and Aesthetics Studies. We also attended the in-person ISR meeting in Millinocket on May 4, 2023, when the Recreation and Aesthetics Studies were discussed, and participated in field visits and focus groups associated with those studies. Based on that participation and on our review of the Year 2 study results presented in the USR and USR Meeting Summary, we offer the following comments.

Recreation Study

The Bureau appreciates the 233 additional user surveys collected as part of the Year 2 study effort, which substantially strengthens the overall study data as a basis for evaluating recreation needs. ***The Bureau strongly believes that surveys collected from users of non-Project recreation sites should be included in the study analysis and results, as also requested by several other stakeholders.*** In particular, the surveys collected from users of the Chesuncook Lake remote campsites (including on Gero Island), and at Chesuncook Village/Graveyard Point, all of which are owned and/or managed by the Bureau, as well as from campowners on the lake, are vital to a complete and accurate analysis. In our prior comments in the ILP, we have highlighted the known and potential adverse effects of project operations on the use and enjoyment of Chesuncook Lake on these user groups. The severe summer drawdown that occurs some years substantially affects water access to these sites and the aesthetic quality of recreation on the shoreline and on the water.

In the USR meeting summary, GLHA states that it will file additional information related to the surveys completed for non-Project recreation sites at a later date. This information should not be limited to the raw survey data but should incorporate that additional survey information into the analysis of recreation and aesthetic issues.

Aesthetics Study

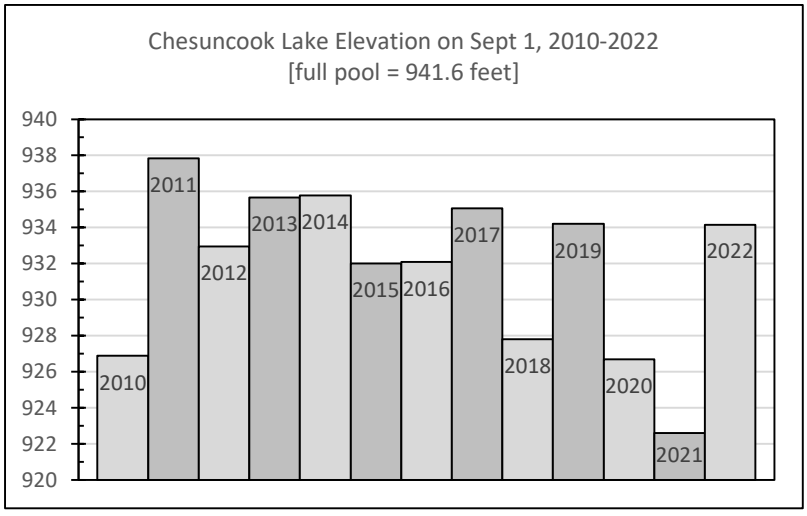
The Aesthetic Study's analysis of the effects of drawdown on the aesthetics at Chesuncook Lake is in part based on photographs taken in June 2022 (representing "high water") and September and October 2022 (representing "low water") during higher-than-normal elevation levels. In particular, the photos taken at remote shoreline campsites and at locations on the lake intended to capture a boater's perspective fail to adequately document conditions that campers and boaters are likely to encounter many years.

The photo dates and lake elevation on those dates were as follows:

| Date | Lake elevation |
|---|---|
| 6/21/22 | 940.3 ft. |
| 9/13/22 | 932.8 ft. |
| 10/28/22 | 934.3 ft. |

*(full pool=941.6 ft)*

The chart below makes use of lake elevation data provided by GLHA. The September 1 date represents the end of the summer season. During 7 of the 13 years in this period, the lake was already at or below 933-934 feet elevation (approx. elevation when the fall 2022 photos were taken) by September 1, and during several years was 5-10 feet below that elevation. This indicates that the September and October 2022 photos do not provide an adequate basis for comparison of the effects of the drawdown in years with greater than average drawdown (e.g., dry years).



The Caribou and Chesuncook Lake Associations submitted to FERC, with their 6/24/24 comments, a number of photographs that depict low water conditions on Chesuncook Lake as viewed from and near remote shoreline campsites and various other locations on the lake. The Bureau believes these photographs better represent the conditions campers and boaters are likely to encounter many years, particularly in late summer and fall, and should be included in the analysis. Dates the photos were taken are not provided so the lake elevation cannot be ascertained. However, the Lake Associations may be able to provide dates for the photos, which would allow the approximate lake elevation to be determined and strengthen the analysis.

Thank you for the opportunity to submit these comments. Please feel free to contact me at (207) 287-2163 or via email at Jim.Vogel@maine.gov if you have any questions.

Sincerely,

Jim Vogel

Jim Vogel, FERC Coordinator
Bureau of Parks and Lands

Cc: Andrew Cutko, Director, Bureau of Parks and Lands
Laura Paye — MDEP
John Perry — MDIFW

**Maine Professional River Outfitters**

June 30, 2024

Debbie-Anne A. Reese
Acting Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Re**: Ripogenus Project (P-2572) and Penobscot Mills Project (P-2458)
Comments on Updated Study Report

Dear Secretary Reese:

## Introduction

Maine Professional River Outfitters (MEPRO) is an organization of the commercial rafting outfitters that operate on a fourteen mile stretch of the Penobscot River, from below McKay Station to Nevers Corner. MEPRO members seek to ensure that this licensing process carefully considers the licensee's obligations to the commercial rafting industry and provides adequate mechanisms to ensure compliance with those requirements. Maine's rafting industry plays a vital role in bolstering the State's rural economy by attracting tourists and providing employment opportunities in remote areas. We appreciate the opportunity to provide comments on licensee's updated study report ("USR").

## Ensuring Adequate Flow During Recreation Hours

Under the existing FERC license, commercial rafters and the whitewater rafting industry have historically had recreation flows from May 1 - September 15 between the hours of 8:30am-5:00pm. MEPRO seeks to ensure that this arrangement is preserved and that a minor logistical adjustment is made to more fully satisfy that arrangement.

Under the existing license, the agreed-upon flows are set forth below:

| ***Whitewater*** | |
|---|---|
| May 1 – September 15<br>(8:30 AM – 5:00 PM) | Normal hydrologic year[3]:<br>• 2,300 cfs on Saturdays and Sundays<br>• 2,200 cfs on Mondays and Fridays<br>• 2,000 cfs on Tuesdays through Thursdays<br>Wet or dry hydrologic year[3]:<br>• 2,200 cfs on Saturdays and Sundays<br>• 2,000 cfs on Mondays and Fridays<br>• 1,800 cfs on Tuesdays through Thursdays |
| September 16 – October 1<br>(8:30 AM– 5:00 PM) | Normal hydrologic year[3]:<br>• 2,300 cfs on Saturdays and Sundays<br>Wet or dry hydrologic year[3]:<br>• 2,200 cfs on Saturdays and Sundays |
| June 8 – October 14<br>(5:00 PM – 8:30 AM) | 1,000 cfs |

Recreation flows are guaranteed from 8:30am-5:00pm, with a minimum of 1800 cfs being released during a wet/dry year on certain days of the week. The minimum flow required to run a safe and enjoyable whitewater rafting trip are the flows that are currently required in the license– including a minimum of 1800 cfs on a wet/dry year, and 2000 cfs on a normal year.

In order to ensure that recreational flows are available during the agreed upon hours, we request earlier releases that will enable recreation level flows to reach all commercial access points (McKay and Nesowadnehunk) by 8:30am as contemplated in the Operations Model Logic and Validation Report.[1]

Our members have experienced that, in a dry year when the turbines may be dropped to just 1 operating turbine overnight, an earlier release is needed to ensure that the recreation flow reaches McKay and Nesowadnehunk Falls by 8:30am. To illustrate, some of our members put their rafts in at 8:30am at McKay Station for a full river trip, which could mean taking out as late as 5:00pm at Nevers Corner. Other members begin their trips by putting-in at Nesowadnehunk Falls and run the McKay Station portion of the river after lunch. Outfitters are given specific launch times and locations by the Department of Inland Fisheries and Wildlife, and our members want to ensure that adequate flows reach the entire fourteen mile stretch on which we operate by 8:30am and are maintained until 5:00pm. Under the current permitting regime, when flows have dropped below 2000 cfs overnight, outfitters have experienced low water during the identified recreation hours of 8:30am to 5:00pm. This inhibits their ability to begin river trips on time, negatively impacting user experience and making scheduling less predictable.

Based on our experience working and recreating on the Penobscot River, we submit that an earlier release from McKay Station when flows are dropped below 2000 cfs overnight is necessary to ensure sufficient recreational flows make it to Nesowadnehunk Falls by 8:30am for our members who put in there. This earlier release would guarantee whitewater rafting operations could be

[1] *See* Section 5.2.3.5 Recreation Flows, *Appendix A: Operations Model Logic and Validation Report* (April 2024).

reliably scheduled and provide consistent recreation flows during the recreation hours throughout the fourteen-mile section we raft.

To be clear, MEPRO is not proposing any changes to the minimum flow requirements in the existing license, but rather a refinement to the process undertaken to increase the low flow up to the recreation flow by the start of designated recreation hours, due to slow fill in Nesowadnehunk Dead Water and Abol Dead Water. Commitment to an earlier release time under low flow scenarios will allow the whitewater industry and its customers to have confidence that recreation flows will reach launch points at a time and in a manner that enables predictable launch times, and a consistent flow throughout the river for running rapids. MEPRO wants to ensure that the license provides the whitewater rafting industry adequate flow for running the river beginning at 8:30am, whether putting in at McKay Station or Nesowadnehunk Falls.

Consistent and predictable flows are critical to the smooth and successful operation of the commercial rafting industry. MEPRO and its members want to ensure that the license creates a requirement to maintain these flows during the full breadth of designated recreation hours. The simple act of preserving our existing arrangement will provide significant benefits to support outdoor recreation and tourism, which, with the decline of other industry, has become the number one industry in the area and is increasingly important to Maine's rural economy.

**Gage Installation**

MEPRO and its members support installation of U.S. Geological Survey ("USGS") streamflow gage(s) as described in the USGS Gage Feasibility Study Report.[2] The Report indicates that streamflow gages would use satellite technology to transmit near real-time data about flows. Having access to contemporaneous data about flows would provide the whitewater rafting industry with actionable information to aid in monitoring water levels and scheduling rafting trips.

The Report concludes that an appropriate location for a USGS gage would be in the vicinity of the Big Eddy Campground. MEPRO recommends installation of USGS gages in two locations: (1) somewhere in the area between Telos Bridge and Big Eddy and (2) in the vicinity of Abol Bridge. Placing USGS-maintained gages at these locations would confirm whether adequate recreation flows (up to the agreed-upon historic flows) are reaching whitewater rafting put-ins at McKay Station and Nesowadnehunk Falls by the start of recreation hours.

**Repair and Maintenance of the McKay Station Put-In**

Finally, MEPRO and its members formally request that the license require timely and regular repair and maintenance of any licensee-controlled put-ins. MEPRO and its members are

[2] *Appendix B: U.S. Geological Survey Gage Feasibility Study.*

particularly concerned that the McKay Station put-in is still in need of repair work following the last damaging high-water event.

The license should require that all repair and maintenance of put-ins following spillover events at Ripogenus Dam is completed by May 1 each year. MEPRO and its members depend on the put-ins being in safe, working order to access the river and operate our businesses. A May 1 deadline to complete put-in repair and maintenance would ensure the river access points would be ready to accommodate whitewater rafting trips on the Penobscot River at the start of each season. We also request that the license requires reasonable efforts to repair put-ins in a timely manner following any mid-season spillover events.

**Conclusion**

MEPRO's goal is to protect and maintain the water levels the whitewater rafting industry has historically enjoyed and relies on for its continued operational success while also acknowledging the importance of other interests in and uses of the Penobscot River. We favor a water management system that supports a stable operating environment and look forward to the collaborative stewardship of this important natural resource among a diverse set of stakeholders. Thank you for the opportunity to provide these comments.

2.1.1 per article 401

100 cfs July/August is water that comes fromThe top of the lake and is too warm and unattractive to concerned fish species. 100cfs doesn't allow for any whitewater recreation.

This minimum should increase from Rip Dam to around 350cfs from a deep gate for the July-September requirement. This volume of water coming from the bottom of the lake would facilitate attractive water conditions for salmon and trout and increase their summer habitat substantially. while also creating a very high quality class III whitewater paddling environment, plus add major aesthetic value to those looking to enjoy a remote forested gorge.

Any requests during re-licensing, to fully study the whitewater recreation conditions between rip dam and McKay hydro station have been largely ignored by GLHA and FERC. The data that was presented during the study reports shows an incomplete picture, a picture that accommodates GLHA wishes to prevent whitewater recreation between Rip Dam and McKay station. GLHA has also resisted any effort to improve the informal trail leading down to the river in the upper gorge that would facilitate whitewater boating, fishing, and aesthetic views of the upper gorge.
The data presented and collected from river users and YouTube videos only accounts for about a median portion of total data of the range of flows that can come from rip dam. Only flows 1400cfs-7000cfs were used in any of the studies. There is absolutely NOTHING from 110cfs-1400cfs, and therefor the study is incomplete. I think a study modification request is appropriate to address the lack of data of the reach in a low water environment

Currently the only reason GLHA spills water down the Ripogenus Dam is to accommodate for spring freshet flows, flooding, and for emergency use to sustain minimum flow requirements. And thus the only whitewater recreation that has been available to users, at a very short notice, has been in a high volume environment, 1400cfs and above, certainly a class IV-V run. There is no data showing the whitewater conditions from 110cfs to 1400cfs, to not include information from 110cfs to 1400cfs will paint an incomplete picture of the whitewater possibilities between rip dam and McKay station, and without a complete picture, FERC can't possibly make a fair decision based on the data. I have personally paddled it at these lower level ranges and found amazing and very manageable class II-III whitewater circa 2017, it's definitely not the high adrenaline, high risk class IV-V run that users see at higher flows. These lower flows will accommodate a much larger user group and present a much safer overall environment for whitewater paddlers, while also creating better fish habitat. In my eyes increasing the summer flow release from 100cfs to 350cfs is a win win for whitewater boaters, the fishermen, and the fish and bugs of the Penobscot.

Concerning the Ambajejus Boat Launch Area. The data presented about the Ambajejus Boat Launch shows the lowest ratings for parking availability at the boat launch. Brookfield in the winter of 23-24 put up concrete barriers to block an adjacent parking area that has been utilized by local businesses for decades along the access road to the Millinocket Lake Pump house. Since this happened the parking situation for all parties involved has greatly deteriorated. During several meetings I mentioned this and Randy Dorman responded it was a nuisance issue outside the project boundaries. This area I'm I referring is along the road to the Millinocket Lake Pump House which is certainly in the project boundary of this re-licensing. In early meetings with Brookfield on this issue concerned parties brought up different ideas of placing signs informing people they are parking at their own risk or finding a way to place a public easement on the area so it could be continued to be used by the public and local businesses. However Brookfield said they discussed it internally and won't pursue any other course of action to restore this parking area. Meanwhile Fred Michaud with the DOT took a dirt parking area capable of fitting 40 vehicles, and turned the lot into a

rest area with only 15 parking spaces. Fred has now banned all employees, guests, and company vehicles from utilizing this area. This does not only force all North Country Rivers employees to park at the Ambajejus Boat Launch parking, but also all of the Big Moose Inn employees, the Northern Outdoors employees, and all of golden road crossing employees, this is a considerable new parking strain in this vital tourist area and all these employees and guests are forced to use the already strained Ambajejus Boat Launch Parking. This is not a “nuisance” issue for four businesses and the most heavily used boat launch in the region. This is all because GLHA simply refuses to work with affiliated parties to come up with a solution at the Millinocket Lake Pumphouse parking area. It is my belief that the newly blocked off area, is in the project boundary and that FERC needs to require GLHA to work with the local businesses to come up with a solution. Or alternatively GLHA must be required to greatly expand not only the parking at Ambajejus Boat Launch but also add bathrooms to accommodate the needs of this high use tourist area.
When it comes to the issue of a whitewater boating study taking place below stone dam. I have fundamental problems with the methodology and utilization of resources to properly study this section of river. First I’d like to point out that there seems to be a massive discrepancy about how GLHA can release water from Stone Dam. During the meetings in early June GLHA representatives when asked, kept referring that only Mike Osbourne could speak to these specific issues. GLHA several times stated he was the only one that could speak to these specifics, however he wasn’t available for the meeting. It just seemed all too convenient that he couldn’t make this meeting to discuss one of the biggest discrepancies. GLHA ability to control water releases from stone dam. The absence of Mike Osbourne from the meeting so THE SPECIFICS could not be discussed allows GLHA to avoid answering some very important questions. Whilst playing into their stalling strategy, his absence just seemed all too convenient for GLHA to be a coincidence. That issue aside, GLHA said they are going to conduct a whitewater boating survey from shore and only at leakage flows. This is completely inadequate, and inconsistent with the Whittaker studies methodology. Seeing a river from shore and running a river are completely different experiences. For example a friend and I wanted to determine the lowest level we could kayak Orbitin Stream at over in Phillips, Maine. spring 2023. We hiked along the banks to the put in and visually concluded that there wasn’t enough water. However we wanted to be sure. So we put in the river anyway and to our surprise found that the water channeled up enough that we could kayak it without constantly hitting rocks. There we were on shore already forming a conclusion which after actually getting in and paddling found our prior conclusion, to be greatly wrong. To me it’s insulting to the river reach to conduct this study from shore and only with minimal flows to “fully”study the opportunities below stone dam. This is a once and a 30 year shot to do this. If you’re going to do anything you might as well do it right…. And not half assed. Which half assed is the perfect adjective to describe the methodology proposed for the level 2 Whittaker study below stone dam.

After a third successful Millinocket X-Stream Canoe Race, and several youth programs that took place around that time. it is completely and 100% clear that scheduled releases on Millinocket Stream can provide diverse recreational options for many different user groups. The value of this local resource to Millinocket cannot be overstated. I personally co-lead two trips down Millinocket Stream with local high school students from Millinocket and Houlton high schools. The happiness, excitement, and positive emotions coming from the students during these outings cannot adequately be described in words. During the release for the race weekend, over 150 whitewater paddlers were able to enjoy the Stream from all points New England. It is of my opinion that this years provided flow of 650cfs is the perfect flow to accommodate the widest range of whitewater paddlers on this stretch. It is also my belief that the GLHA should no longer pump 240cfs from Millinocket Lake into Ambajejus Lake for profits and this water should instead be allowed to freely flow its natural course down Millinocket Stream creating better fishing and boating opportunities on this tremendous resource for more days per year. The whitewater quality is so high on this section that if there was scheduled releases on Millinocket Stream local organizations and

rafting outfitters would be able to expand their offerings to include the class II-III Millinocket Stream for rafting and kayak trips. Currently the only whitewater offered by outfitters is on the class IV/V Penobscot River. For an outfitter or organization to diversify their options to include Millinocket Stream would mean they are unlocking a whole new and different customer base helping the businesses hire more employees and create more revenue. Scheduled releases on Millinocket Stream is a 150% win for the town, residents, and outfitters in the Millinocket Area.

The evidence is clear that if you schedule releases or provide flows adequate for whitewater boating, people will come and utilize the whitewater. Millinocket Stream is the perfect example. FERC needs to require more releases on all the river reaches from GLHA because at the end of the day the water DOES NOT BELONG TO BROOKFIELD, and they should not be entitled to maximized profits. Great Northern Paper built all this infrastructure for the purpose of paper making and providing timber to the economy. With the paper and timber industry being a fraction of what it was, Millinocket continues to struggle with economic issues from the fall out of Great Northern, but Millinocket has a strong foothold and is rebirthing its self as an outdoor recreation hub. It is the duty of this federal organization FERC to help this community, by ordering GLHA to do everything they can to provide water flows from rip dam to McKay, below McKay, and through the back channel below stone dam, and below Millinocket Lake Dam. There are several large scale whitewater hubs in the US, the largest being in White Salmon, Washington and in Fayetteville, West Virginia. These hubs have gained notoriety and popularity because of their diverse options for whitewater, causing a large community of paddlers to form in these areas. While Millinocket may never be able to compare to these communities because of our remote location and economic situation. With the help of FERC and GLHA, Millinocket could offer a similar level of diverse paddling opportunities as seen in the large scale whitewater paddling communities.

July 1, 2024

Ms. Debbie-Anne A. Reese
Acting Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Via online submission to: http://www/ferc.gov**

Subject: **Comments of Maine Council of Trout Unlimited on the Updated Study Report for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458)**

Dear Acting Secretary Reese:

On behalf of its six chapters and over 2,000 members, Maine Council of Trout Unlimited ("TU") submits these comments on the Updated Study Report ("USR") for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) filed by licensee Great Lakes Hydro America, LLC a subsidiary of Brookfield Renewable ("Brookfield" or "Applicant").[1] This filing also responds to the Report of the USR Meeting held May 15 and May 16, 2023 in Bangor, Maine,[2] and Brookfield's proposed and unresolved Ramping Study circulated by email, and subsequently filed to the FERC docket by TU.[3]

**General Comments**

Taken together, the Ripogenus and Penobscot Mills relicensings reflect over 105.4 MW of generation capacity making this the largest relicensing effort in the state of Maine in terms of electricity production by a large margin. The waters and surrounding habitat affected by these relicensings are of similar scale and significance with a combined Project area containing an affected drainage area of 3,533 square miles, hundreds of miles of river and tributaries, and multiple large lakes. The land-locked salmon fishery below Ripogenus Dam is sustained by naturally spawned fish and nationally known for its high-quality fisheries habitat. With Maine's highest mountain nearby, Ripogenus Gorge below the dam is Maine's most spectacular gorge. The waters of the Penobscot Mills Project are also important in their own right and should play a part in the restoration of currently dewatered sections of the West Branch of the Penobscot River to provide traditional waterways and sustenance fisheries to the Penobscot Indian Nation (PIN) that have been so long promised but not delivered.

**Studies conducted to date have not provided the information required to make informed decisions on the terms and conditions of a new license, and those currently approved will not correct this.** Changes in project ownership have resulted in changes to the way the projects are operated, starting at and most affecting the Ripogenus Project and extending downstream to Penobscot Mills Project. In a number of cases, studies conducted have not provided the information and data they were intended to provide, or have served to underline the need for additional studies. Additional information is needed to limit the drawdowns to the Ripogenus-Chesuncook Reservoir and to peaking operations being conducted at McKay Station. From McKay Station to Stone Dam, the watershed has been extensively modified, and how to optimize project operations

[1] Great Lakes Hydro America, LLC, Initial Study Report for the Ripogenus (FERC No. P-2572-133) and Penobscot Mills (FERC No. P-2458-247) Hydroelectric Projects dated April 22, 2024.
[2] Ripogenus Hydroelectric Project (FERC No. P-2572-133), Penobscot Mills Hydroelectric Project (FERC No. P-2458-247), Updated Study Report Meeting Summary dated May 31, 2024.
[3] TU letter dated June 5, 2024, Subj: Status of Consultation for Studies for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458).

so as to provide the best balance of between electrical power generation and the other uses including fishing, recreation (especially whitewater), aesthetics, and habitat must be found.

Brookfield entered into the relicensing process stating that "PM&E measures comprehensively address resource interests specific to the Project areas"[4] despite the obvious radical changes that had occurred since the last relicensing. The non-government stakeholders (NGOs) took exception to this and stated so on the record:

> "These assertions could not be more wrong and started the relicensing off on the wrong foot. A glaring example: The Ripogenus-Chesuncook impoundment has not been fully watered in two years, and the boat launch provided as PM&E has been so far from the waterline for most of the summers so as to be practically unusable, as many photos have clearly shown. The public interest has vastly changed since the last relicensing. Agencies bent over backward to ensure the profitability of the mills in East Millinocket, the major employer in the area, that were supplied by power the projects provided. If that were not the case, the Use Attainability Analysis (UAA) and the provisions of 38 M.R.S.A. § 464(9-A) would not have allowed so much leeway for project operations, e.g., no minimum drawdown for the Ripogenus-Chesuncook impoundment other than the lowest levels the physical characteristics of Ripogenus Dam allow. Other examples included the dewatered Ripogenus Gorge on the main stem of the West Branch below Ripogenus Dam and 4.5 miles of the main stem below Stone Dam. It is highly unlikely that these examples would have been permitted under the last relicensings were it not for economic considerations that simply no longer exist. With the mills closed and the electricity produced by the projects going to the grid and not dramatically affecting the economy of the region, the situation has changed greatly, and that change needs to be acknowledged for the relicensing process to proceed effectively under the ILP."[5]

The NGO filing went on to state that Brookfield was attempting to "delay and confuse the process."[6] Brookfield's actions appear to have continued in the same vein. Rather than conduct studies that inform the relicensing by comparing the effects of flows on different facets of the project, Brookfield has provided little data that provides a rational or informed basis for comparison. Consultation with NGO stakeholders has been minimal. On the present course, there will be inadequate comparison data upon which to base key relicensings decisions like minimum flows below Ripogenus Dam or Stone Dam. The likely result will be delay and litigation – neither of these are in the public interest, and both are outcomes that TU seeks to avoid. To meet the requirements for a Maine Water Quality Certification, the new license will certainly contain provisions to water the reaches of the main stem of the West Branch of the Penobscot River in Ripogenus Gorge and below Stone Dam and establish a set of rules for managing water levels in Ripogenus – Chesuncook Lake. Delay will benefit Brookfield since it will not be able to generate electricity at current levels under a new license with new minimum flow requirements. Comments by both FERC staff and Brookfield at the USR Meeting also both confirmed some delay in issuing the Ready for Environmental Analysis (REA) and thus to relicensing, largely due to the July 8, 2023 failure of two of the three generators at McKay Station due to maintenance errors complicating flow management and making conducting flow-related studies problematic. Taken as a whole, the conclusion that Brookfield neither wants a comprehensible and defensible environmental review or to have this matter resolved in a timely manner is inescapable. As this behavior is expected to continue, TU objects.

Specific comments follow that support this conclusion and request corrective action.

[4] Brookfield Notices of Intent and Pre-application Documents for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) dated June 11, 2021, page 1-8.
[5] NGO letter dated February 10, 2022, Subject: page 2.
[6] Id, page 4.

**Specific Studies**

Appendix A: Operations Model Study Report

**Brookfield is limiting model runs to further own agenda: Maintenance of the current minimum flow regime**.

Even though Randy Dorman said at the USR Meeting that Brookfield had filled Ripogenus-Chesuncook Lake to over 939 asl this spring, Brookfield refuses to conduct Ops Model runs above that elevation. Brookfield's own data shows that it has filled the lake to above that level often in the past: Operations data from 2010-2022 shows lake elevation on May 15th at 940 asl or above every year except 2012, 2013, 2015, 2016 and 2021.[7] Given these data, the upper limit should be 941.6 asl, the physical, but safe limits created by Ripogenus Dam. By failing to run the Ops Model at a more realistic and historically accurate fill regime, **Brookfield is misleading the available fill volumes, making less profitable flow scenarios seem less feasible than they truly are. Stated another way, if Brookfield raised the lake fill level, it could offset or at least mitigate the economic impacts of increased minimum flows required for other purposes.** This 2.6 feet of elevation equates to billions of cubic feet of water with enormous potential use, not just for power generation but to provide flows to maintain lake levels allowing access to boat ramps in Ripogenus-Chesuncook Lake and flow into Ripogenus Gorge to create both whitewater and recreational fishing opportunities as well as improve the aquatic habitat. It is well established that Brookfield uses even smaller amounts of water level variance elsewhere in Maine in its many run-of river projects to conduct peaking operations, varying flows to maximize the profitability of its electricity, but degrading both the aquatic habitat and recreational fishing opportunities in the process. Efficient management of lake fill levels can mitigate this degradation.

Brookfield refused to run a full range of flow scenarios in Upper Ripogenus Gorge or Stone Dam or the set of runs agreed on and requested by NGOs.[8] Comments provided under the Angler Flow Eval Study Report elaborate on Stone Dam scenarios and provide additional details.

Brookfield filed an Updated Study Report Supplement on June 28, 2024[9] that reported the results of the Ops Model runs. In general, rather than examine a range of scenarios to define potential future project operations, Brookfield only ran the scenarios that suited its agenda. Our preliminary comments on it are: (1) It does not look at maximum lake capacity of 941.6 making less profitable flow scenarios seem less feasible than they truly are. (2) It did not run the set of parameters jointly requested by NGO stakeholders representing fisheries interests, camp owners, whitewater and hiking interests. (3) Brookfield did not test a constant minimum 200 cfs flow below Stone Dam. Brookfield has apparently already made the determination that only a seasonal put-and-take fishery would be supported below Stone Dam and that there is minimal impact in a seasonal operating mode. Brookfield should have tested the effects of the 365-day scenario as requested. The runs did not answer the question if there is potential (with minimal impact to generation) if we have 365-day flows. With refugia available downstream at Shad Pond year-round trout and landlocked salmon is survival possible. There are no studies that show a causal relationship between actual flow changes and fish biomass and the predicted fish biomass that IFIM says would be there. When IFIM predicts increases or decreases in fish based on the IFIM Models, the resulting fish populations never agree with what the model predicted. (5) Brookfield's statement that "Higher Ripogenus Impoundment elevations in the fall result in increases in spill occurrences " implies that this would be a negative outcome. TU views this as providing additional benefit to scenic users, not a negative project outcome. (6) The study shows a need for an alternative value/benefit assessment instead of the percentage change in generation at each production station. The real issues are the effect on total generation and the actual dollar cost. This feeds into the need for an overall cost benefit analysis that

[7] Hourly Operations Data (2000-2022) filed electronically in MS Excel format) (Supplement to the Historic Operations Data Assessment Study Report filed as Appendix A of the April 22, 2023 Initial Study Report.

[8] NGO letter dated March 5, 2024, Subj: NGO Requests for Ops Model Runs for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458).

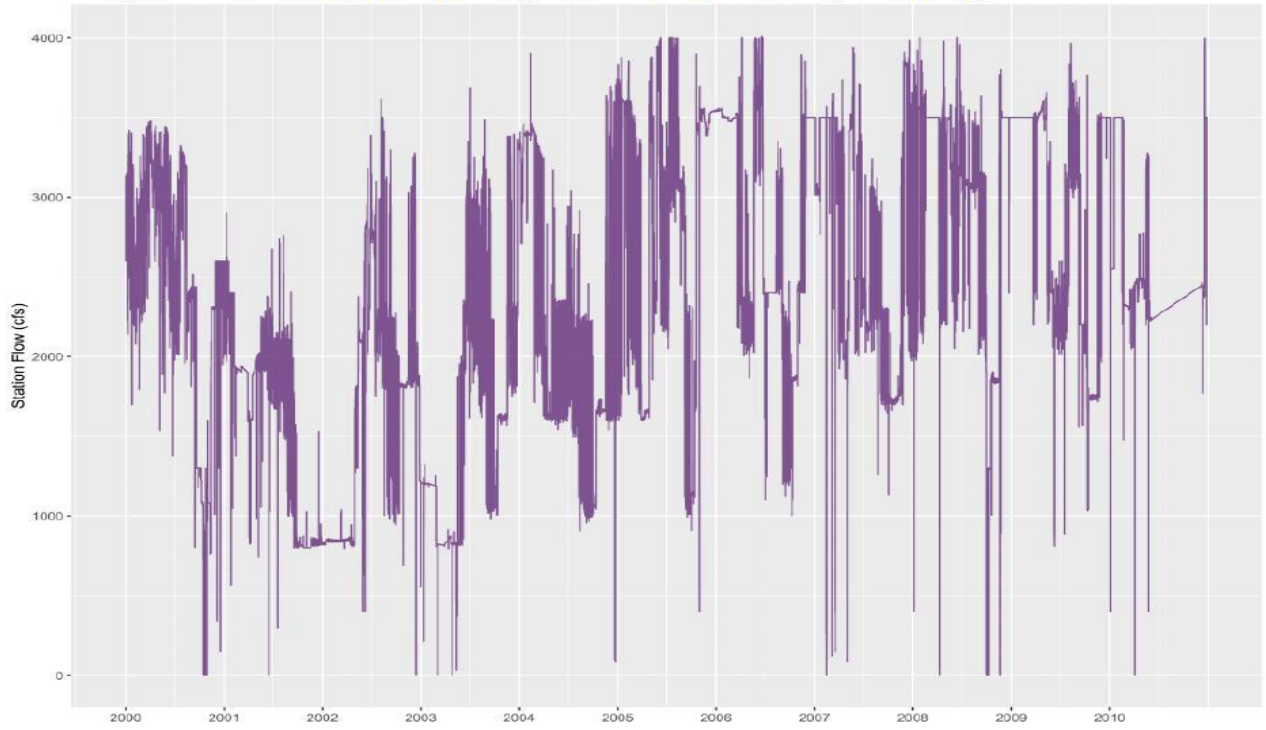
[9] Brookfield letter dated June 28, 2024, Subject: Ripogenus Hydroelectric Project (FERC No. 2572-133), Penobscot Mills Hydroelectric Project (FERC No. 2458-247), Updated Study Report Supplement.

looks at stakeholder value metrics with dollar values assigned as opposed to just changes in generation. Pure flow numbers are only part of the analysis. The larger issues include: What is the value of a roaring fall in the gorge to Millinocket economics. How many people would be coming up to raft, fish or just visit if alternative flow were implemented? What are the incremental added benefits to regional economics-consumer surplus? This analysis is needed to leverage model results. **TU requests an economic cost-benefit analysis of the impacts of the various proposed flow changes as described in Loomis 2000.**[10]

**The validity of the Ops Model itself is questionable.**

The version of the Ops Model contained some adjustments to the version that was presented at the Ops Model Workshop. **The Ops Model version in the USR contained a change to the most important feature of the model: predicting levels of Ripogenus- Chesuncook Lake based on flows from Ripogenus Dam/McKay Station.** TU's first observation when the Ops Model was referenced in the Initial Study Report (ISR) Meeting was that the figure below showing the relationship between flows from McKay Station and flow was impossible, stating: "The figures showing hourly McKay Station flows based on generation data show flows of 4000 cfs, especially Figure 12 below. These exceed the 3500 cfs hydraulic capacity of McKay Station [Pre-application Document dated June 11, 2021, page 4-14.]

**Figure 12. Estimated hourly flows from McKay Station, 2000-2010**




These exceed the 3500 cfs hydraulic capacity of McKay Station [Pre- application Document dated June 11, 2021, page 4-14.] When queried at the ISR Meeting, the Brookfield response was the flows were not completely accurate and a range of variability was not available. This continues to cast doubt on the results of the analysis."[11] It should also be noted that this graph is even worse than it seems as the values above 4000 CFS are truncated, making this data even less reliable. It is apparent that there are still problems with

[10] Loomis, John B., 2000 Environmental Valuation Techniques in Water Resource Decision Making. J. Wtr Res. Planning and Mgt. 126(6):339.

[11] Maine TU Council ISR Comments dated July 5, 2023, Appendix A.

modeling this most basic and important factor in flow and lake level management that fundamentally affects both the Ripogenus and Penobscot Mills Projects.

It was stated at the USR Meeting that a third version of the model will be forthcoming, but that was not included with the USR Meeting Report. After using words like "calibration" and "validation" at the Ops Model Workshop back in May, such an important change to the Ops Model was surprising, and TU expects that further changes will be forthcoming to the Ops Model.

Per the NGOs' earlier comments,[12] "…many assumptions were made to generate the model, e.g., flashboard installation, proration of Seboeis flows, rules on how the project is operated, correlation between generation data and actual flows, etc. Variability was not quantified but some variability must be expected." The absence of a flow gauge in the West Branch below McKay Station causes the model to be based on assumptions and circular logic rather than empirical data. This is further reflected in the comments on USGS Gage Feasibility below.

**For these reasons, the credibility of the Ops Model is strained at best. Brookfield is using proprietary CHEOPS software to generate the model making it impossible for stakeholders to duplicate or validate. Accordingly, TU requests that an independent, peer-reviewed study be ordered by FERC to determine the validity of the model for making relicensing decisions related to flows and lake levels.**

Appendix B: USGS Gage Feasibility Study Report

TU strongly agrees that a USGS gage between Ripogenus Gorge and the Big Eddy Pool is needed. Both FERC staff and Brookfield acknowledged that a delay in relicensing is likely; TU believes that other delays will be forthcoming. **Accordingly, TU asks that Brookfield implement a temporary means to gage flows other than by inference from power generation between the present and when the new license is issued.** This is the most direct method available to improve the validity of the Ops Model. This would also serve to inform the ongoing FERC Compliance investigation and search for an interim solution to the significant fishkill that occurred on July 7, 2023.

TU also requests that Ripogenus-Chesuncook Lake levels be made available on the Brookfield SafeWaters website between now and when the new license is issued so that boaters have a means to determine if the boat launches on the lake are accessible.

Appendix C: 2023 Water Quality Study Report

"Based on the feedback received from the MDEP during the meeting, GLHA plans to re-sample for macroinvertebrates at six locations in 2024 with a focus on more representative habitats in the West Branch that are suitable for macroinvertebrate colonization. The 2024 sampling locations will include representative riverine habitat downstream of McKay Station, Little Ambejackmockamus Falls, North Twin, the Millinocket Development, Millinocket Lake Storage Dam, and Dolby Dam."

TU does not see how the reach below Stone Dam could be represented as meeting Maine Water Quality Standards because the reach is dewatered for most of the year and based on Maine environmental statutes, TU believes that Maine Department of Environmental Protection will reach the same conclusion. It simply does not have the minimum flows, or at times any flow, to sustain an aquatic environment or aquatic species. This is clear error.

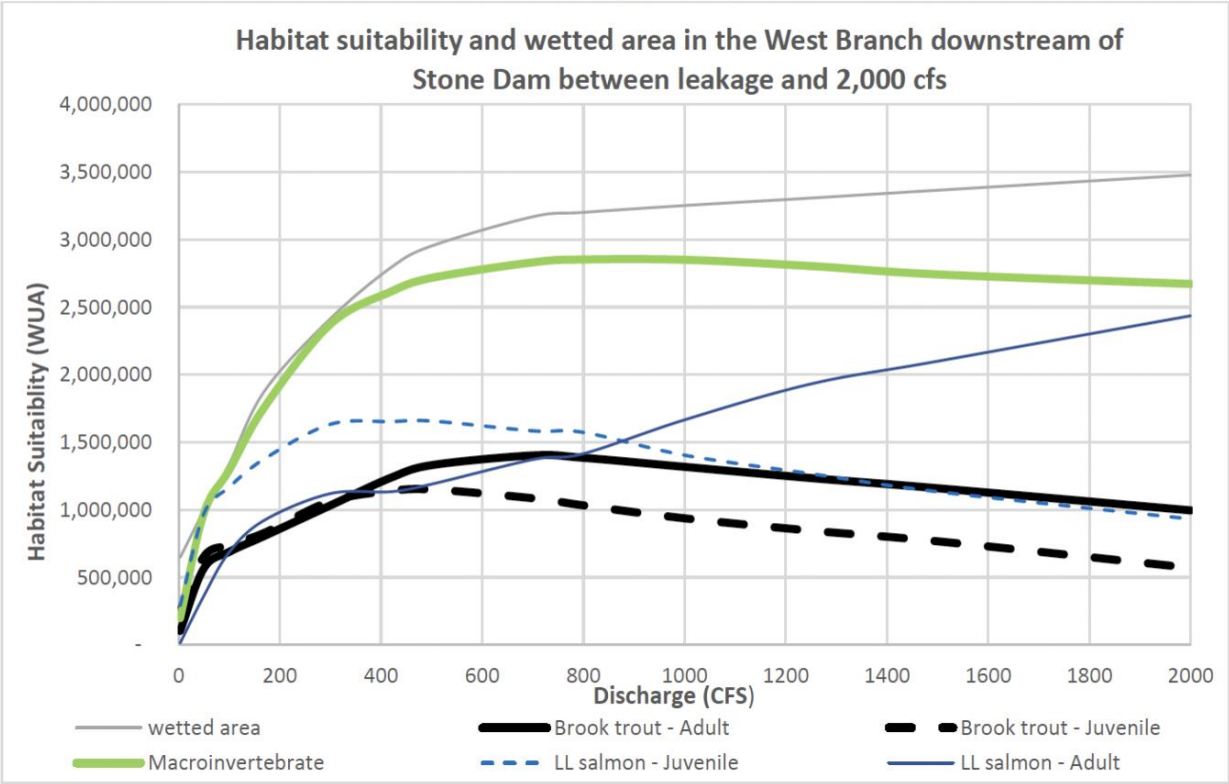
[12] NGO letter dated March 5, 2024, Subj: NGO Requests for Ops Model Runs for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458).

TU notes that the results of water quality studies of Ripogenus – Chesuncook Lake would have been very different if conducted during dry years 2020 or 2021 when the littoral zone was dewatered. It is this selective data collection and study, only occurring at times when there is water in the reach, that degrades the conclusions reached with regard to water quality and completely ignores the effects of dewatering.

Appendix D: Angler Flow Eval Study Report

**The study had no legitimate scientific basis and was fundamentally flawed with a design that drove results toward a predetermined result.** No pre-study consultation regarding study parameters was conducted with TU who had requested the study and provided volunteers for data collection. This included the key elements of flow and observation locations. Three flows of less than 400 cfs, less than half of what the Fisheries Habitat Study was needed to support adult landlocked salmon (thin blue line) and maximize macro-invertebrate habitat (thicker light green line) were shown by Brookfield's own study[13] depicted in the figure that follows:

**Figure 2. Habitat suitability and wetted area in the West Branch downstream of Stone Dam between leakage and 2,000 cfs.**




Flows were so low that anglers could walk across what is the main stem of the West Branch of the Penobscot River. The mean annual flow in this location is approximately 4,000 CFS[14] if flows were not diverted to Millinocket Station, and did not rejoin the mainstem river until Shad Pond. As TU said in its comments on the proposed study, "the validity of the study will be proportional to the range of flows provided." Brookfield

[13] ISR, Appendix f-11.

[14] USGS StreamStats accessed at https://streamstats.usgs.gov/ss/ for location (Latitude, Longitude): 45.63379, -68.67245 returns 4060CFS.

documentation filed with LIHI indicates that the bladder system installed on Stone Dams can be used to control flows.[15]

It is unremarkable that the study demonstrated that the lower flows are more wadable. Leakage flows and a dry riverbed are even more so. It should be self-evident that wading is easier when there is no water in the channel, and this type of rationale and conclusion reveals Brookfield's intent to maintain low or nonexistent flows despite the negative impacts. Alternatively, higher flows would have provided more habitat and better fishing opportunity. Aquatic Base Flows per longstanding USFWS guidance are ~2,000 CFS based on the drainage area.[16]

Further, no sites were sampled on lower part of "bypass" where best fishing opportunities are located. This is also closer to Shad Pond where you would expect salmonids to find thermal refugia during the summer months before returning on the fall and spring typical of Maine's tailwater fisheries.

The study assumed no access from the east bank. Google Earth clearly shows two roads: one road parallel to the river about 1500 from the water on the east side of the river, the other within 500ft of that section of river. Access should be sought as part of the relicensing effort both for whitewater and fishing recreational access and use.

Study assumed 30 ft fly casting distance. This is an unrealistically shortened distance and reduced the useable/castable area by 50%. Spin fishing would also be possible there with even longer casting distances. The reaches at the flows sampled provided a fishing opportunity more appropriate to a smaller tributary, not the main stem of the West Branch of the Penobscot River where the bulk of recreational fishing is known to occur.

Whitewater recreational use also involves higher flows as well with the whitewater community likely to ask to see flows of up to 2,000 CFS. TU hopes that the in-water portion of that study will be conducted, and wishes to be informed when it will occur so that it can put its own observers in the field.

<u>Appendix E: North Twin Impoundment Tributary Access Survey Study Report</u>

Study did not collect observations at different lake levels. While some redds were observed, little knowledge was gained about where the landlocked salmon in the lake actually go to spawn as the study did not employ radio tracking technology per the MDIFW request. TU strongly concurs with MDIFW Comments that included: "There is virtually no information on what effects Project seasonal water level fluctuations may have, or may not have, on landlocked salmon life histories, most importantly spawning and rearing potential."[17] This is

[15] "Whenever abnormal conditions occur such that a flow cannot be passed through the generators at the Millinocket Powerhouse to achieve the 2,000 cfs minimum flow, the inflatable rubber flashboard system shall be deflated to release flows in an expeditious effort to minimize downriver effects on water quality and aquatic habitat. Except for the initial 2-minute siren warning and a safety flow of 200 cfs for 15 minutes, such flows will not be ramped. The protection of downriver water quality and aquatic habitat is a higher priority than prevention of channel scouring and destruction of vegetation in the Back Channel. During periods of high seasonal flows, the initial 2-minute siren warning and safety flow of 200 cfs for 15 minutes will also be used. Following this 15-minute release, increases of 400 cfs per hour will be made until either the required flow is met, the elevation at Stone Dam is less than 459.45 feet, or the inflatable rubber flashboard system is fully deflated, if necessary. *The ramping up of seasonal flows in the Back Channel will be done only after the hydraulic capacity of those units available has been attained."* Brookfield letter dated June 3, 2019, Subject: Low Impact Hydropower Institute Application for the Penobscot Mills Project -Dolby & Millinocket Developments. Accessed at https://lowimpacthydro.org/wp-content/uploads/2020/07/20190603-Initial-LIHI-Application-Millinocket-Dolby.pdf - page 29, italics supplied.

[16] USGS StreamStats accessed at https://streamstats.usgs.gov/ss/ for location (Latitude, Longitude): 45.63379, -68.67245 drainage area is 2077 square miles. Aquatic baseflow is computed as that value in CFS.

[17] MDIFW Letter dated June 27, 2024, RE: MDIFW Comments on the Updated Study Report for the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458), page 3.

another example of a missed opportunity to acquire additional, timely and accurate information upon which to base relicensing decisions.

Appendix F: 2023 Upstream American Eel Study Report

TU concurs with the results.

The study demonstrated that eels are in the system with levels of abundance and that provisions for eel passage, including deep gate passage, should be included with the new license.

Appendix G: Terrestrial, Wildlife, and Botanical Resources Study Report

No comments.

Appendix H: Riparian and Littoral Habitat Assessment Study Report

Results would have been very different if conducted during dry years 2020 or 2021 when the littoral zone was dewatered and reflects an intention to mislead FERC into believing that sustainable minimum flows are constant and have been historically present when they are not.

Appendix I: Marsh Bird Study Report

TU notes that very few birds were observed given the amount of habitat studied.

Appendix J: Furbearer Survey Study Report given the available habitat

No comments.

Appendix K: Wood Turtle Study Report

No comments.

Appendix L: Second Year Recreation Study Report

Completed recreational surveys were not included by Brookfield for lake campsites or the Big Eddy Campground due to incomplete data. TU notes that there were repeated requests to put surveyors in the field by the stakeholders that would have prevented this from happening. **TU requests that the forms be included in the report, and that given the delay already assumed by FERC and Brookfield, that surveyors be put into the field to collect data throughout the study area during a third year of studies. The fact that Brookfield's efforts to collect recreational use data by less reliable means has continued to fail makes this a logical next step. The Big Eddy Campground is one of the most well-known and heavily used areas on the river the failure to obtain reliable data from this area severely undermines any recreational conclusions that might be drawn.**

Recreational data continues to be lacking in coverage of the Chesuncook Lake part of the Northern Forest Canoe Trail, which includes many BPL remote campsites, and sites in the Penobscot River Corridor that are affected by project operations.

The recreational study does not acknowledge or address extensive use by groups such as - private kids camps, universities, guided canoe trips, etc.

Lack of parking was a persistent theme at boat launches, some of which need work on the ramps. While this was included in the report, other aspects of TU inputs to the Recreational Focus Group were largely ignored. TU has included them as Attachment A. Of particular note to TU are the pull-offs from the Golden Road that provide parking and access to fishing sites on the mainstem of the West Branch. Having recently traveled there, **the Golden Road continues to degrade from pavement to gravel, and recent grading efforts make the pull-offs even less well defined. Over the 40-year span of the license, they will become indistinguishable making parking to access fishing sites problematic and dangerous due to passing logging trucks on this road. TU requests that Brookfield propose a way to maintain pull-off parking or conduct a study to identify how to achieve that.**

TU comments regarding problems with parking at Millinocket Lake Boat Launch, Ambajejus Lake Boat Launch and South Twin Lake Boat Launch were acknowledged,[18] and TU has since heard reports that loss of parking at the Ambajejus Lake Boat Launch has created a major parking problem during high-use periods this summer: holidays and weekends. Brookfield's USR response was: "The comment regarding the need for expanded parking is acknowledged, and the meeting notes for these sites have been updated to reflect this concern. The discussion regarding jersey barriers was not specific to any of the FERC approved Project recreation sites. Rather, this was a concern regarding the potential restriction of parking on the private access road to the Pump House on Millinocket Lake. Jersey barriers do not restrict parking at any of the FERC approved Project recreation sites." The areas involved appears to be in the project area and access to the lake should be a significant concern. The PM&E measures that Brookfield described in the PAD as completely adequate have been eroded, and action needs to be taken to restore access to the resource to accommodate local, tourist and business needs. Comments by whitewater operator Chris Howe stated: "This is all because GLHA simply refuses to work with affiliated parties to come up with a solution at the Millinocket Lake Pumphouse parking area."[19] **TU requests that Brookfield propose a way to restore adequate parking in the area of the Ambajejus Lake and Millinocket Lake launches or conduct a study to identify how to achieve that.**

Appendix M: Whitewater Boating Assessment Study Report

**Brookfield has only scheduled the first phase of Level-2 study methodology established by Whittaker and Shelby. This will likely drive further delays to the relicensing, delays that are avoidable. TU requests that the in-waters portion of Level-2 be conducted this summer.**

Current access to whitewater opportunities below Stone Dam is only available by making a long paddle across Quakish Lake. Access on river left downstream of Stone Dam should be provided where there are existing roads; river right has only logging tote roads and trails. This access would also provide recreational fishing opportunities is the lower reach closest to Shad Pond where fish seek refuge from high water temperatures during the hottest summer months.

Appendix N: Aesthetics Study Report

Purpose of the study was to evaluate the impact of project operations on aesthetics. This was not accomplished because the comparison pictures are at lake levels of 936 asl - a level not seen since 2014. Even with poor comparisons there was a documented decrease in aesthetic quality from full lake to 936 asl. Remote campsites used by a large number of people were not included in the study. Videos and images were not

[18] USR, Second Year Recreation Study Report, Attachment 11-12.
[19] Chris Howe letter filed July 1, 2024.

accepted for evaluation by the focus group, despite emails saying they would be. The study claims that the focus group made decisions when there is no evidence any such decisions were made. The group was told what the studies would consist of, not consulted for input on substantive decisions. **Again, Brookfield did not consult with stakeholders and produced a study that fails to inform relicensing decisions. For the most part, the study merely confirms the obvious: that people in the Maine woods like woods, water and stone. This oversimplification determines nothing and is based on little or no actual data. This is particularly applicable to Ripogenus Gorge where only one flow level was used for the observations. In the absence of comparison data, it should be assumed that higher flows are more useful for recreational and aesthetic purposes.**

The camp owners USR Comments[20] demonstrate dramatically what comparison data looks like by showing aesthetic lake views at differing water levels. Volunteers produced data much more useful that that provided in the Brookfield report.

Appendix O: Environmental Justice Study

FERC policy on Environmental Justice is narrowly defined and the studies conducted by Brookfield exceeded FERC's requirements without identifying environmental justice issues.

**Other Study Matters**

Fish Assemblage Study

Further data collection by the Midwest Biological Diversity Institute was observed by TU members and scale samples were apparently not being taken. This is another example where an easy opportunity to inform the relicensing was missed, in this case, to compare fish growth rate data with the data from the last relicensing to confirm or deny the perception that the world-class fishery described in the last license application is being maintained or is otherwise impacted by Brookfield's operations.

Ramping Study

TU concerns were stated in email to Brookfield contractor Jesse Wechsler provided as Attachment B.[21] The dates proposed for the study were the worst possible dates for the fisheries resources. TU participation on data collection teams was assumed without even asking TU. The study would look at changing between one, two and three generator operations without examining low flows contained in the current license that are based on opinion and past practice rather than empirical data: 1,422 CFS, 1,300 CFS and 1,000 CFS. FERC cannot set minimum flows for the new license without data justifying those flows.

Proposed sampling in the Big Eddy Pool is not indicated. There is no reason to sample an area where stranding is unlikely to occur.

TU has since determined that the basis for the study was not as stated in the Jesse Wechsler email but from a TU Study Request that we have included as Attachment C.[22] We again note that the methodology for ramping studies has been well established by Smokorowski and that Brookfield is well aware of this because it paid for

[20] Caribou and Chesuncook Lake Associations letter dated June 24, 2024, Subject: Ripogenus Hydroelectric Project (FERC No. 2572-133) Updated Study Report Comments.
[21] Email thread filed to the FERC docket by letter dated June 5, 2024, Subject: Status of Consultation for Studies for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458)
[22] Ed Spear letter dated May 1, 2024, Subject: Ripogenus Project (P-2572) Comments and Study Suggestions on the Proposed Ramping Study Plan Issued Via Email on April 24, 2024.

the studies that it subsequently did not follow. This was noted by retired fisheries biologist Ed Spear as well.[23] The proposed Ramping Study is a ramping study in name only.

**TU's request for the status of consultation remains unanswered, and TU has not been consulted on the Ramping Study as the date of this filing.** On June 26, 2024, Jesse Wechsler sent an email announcing the dates of the study as occurring in mid-to-late July.[24] An announcement is dictation, not consultation. It will be difficult to find volunteer observers during the height of vacation season on short notice. TU continues to request that the study should be conducted sometime between August and mid-October of this year, with the later dates having the least potential impacts on the fishery.

**Updated Study Report Meeting**

The report of the meeting Brookfield provided omitted important questions. TU asked where the information supporting the flows of 1,422 cfs, 1,300 cfs and 1,000cfs was located, and the Brookfield representative's reply was that it is in the record, but neither this question nor the Brookfield response were included in the meeting report. This is remarkable given that Ed Spear had already filed specific comments noting the request.[25]

**Conclusion**

Information provided in these comments demonstrates that Brookfield continues to work against the intent of the ILP by conducting studies that fail to reasonably inform relicensing decisions. This is reflected in our comments regarding the Ops Model Study, the Angler Flow Eval Study, North Twin Impoundment Tributary Access Survey Study, the Second Year Recreation Study, the Whitewater Boating Assessment Study, the Aesthetics Study, the Fish Assemblage Study and the Ramping Study.

TU appreciates the direction FERC staff provided in its June 14, 2024 letter[26] especially with regard to determining the origin of McKay Station flows, and consultation regarding the Fish Stranding Study. The information requirements involved are the most important of the relicensing in determining the appropriate flow regime for the new license. While the staff comments did not address the Ops Model runs, the model and input lake elevations will greatly influence future flow regimes. Therefore, it is important that model inputs include lake levels of 941.6 asl, the maximum water surface elevation of Ripogenus - Chesuncook Lake. To do otherwise, Brookfield is dictating future operations, not studying the options. If the full range of options for future project operations are not examined, further relicensing delays and litigation will inevitably ensue.

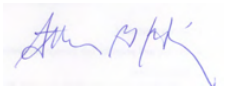
TU also appreciates the staff comments on the Terrestrial, Wildlife and Biological Resources Study, but more so the comments on the Whitewater Boating Assessment Study. If Level-2 is accomplished in stages as Brookfield proposes, not as prescribed by Whittaker et al., it will most likely result in further delays in issuance of the REA. TU also hope to do its own further evaluation of wadability/fishability of the reach below Stone Dam during the whitewater flows that TU expects will include flows of at least 1,000 cfs rather than the less than 400 cfs flows that Brookfield provided for its study.

TU would also like to note that the Year-2 Recreational Study is deficient and that surveyors should be put into the field for a third year of study.

[23] Maine TU Council ISR Comments dated July 5, 2023. Ramping Study Request, Appendix E.
[24] Jesse.Wechsler@kleinschmidtgroup.com email of June 26, 2024 RE: RE: Ripogenus Project Ramping Study Planning – Update.
[25] Ed Spear comment on Great Lakes Hydro America May 16, 2024, Updated Study Report meeting with a focus on McKay Station spawning and incubation flow of 1422 cubic feet per second dated May 23, 2024.
[26] FERC letter dated June14, 2024, Reference: Staff Comments on Updated Study Report and Updated Study Report Meeting.

Maine TU Council appreciates the opportunity to provide these comments on these important projects and hopes that the Commission will continue to act to acquire the information needed to enable the Commission to balance project harms and benefits.

Respectfully,



Stephen G. Heinz
Maine TU Council FERC Coordinator

Copy to: Alicia Jackson, FERC Compliance

**Appendices:**

Appendix A: TU Recreational Focus Group Comments
Appendix B: Ramping Study Request for Status
Appendix C: Ramping Study Request

# Attachment A

February 17, 2024

Uriah Forest-Bulley
Kleinschmidt Corporation
6 Fundy Road, Suite 500
Falmouth ME 40105

***Transmitted via email***

Subject: **Comments on the Recreational Focus Group Summary**

Dear Uriah:

I am submitting these comments on the Meeting/Call Summary Recreation Focus Group Meeting for the Ripogenus and Penobscot Mills Hydroelectric Projects (FERC Nos. 2572 and 2458) held January 22, 2024 that I did attend. Their primary purpose is to clarify, expand and provide emphasis where needed on the group comments captured at the meeting using a white board. I have over 25 years of experience fishing the West Branch and am well acquainted with others who recreate in other ways in the area.

**General Comments.**

Overall approach. The group was presented with selected recreational site that has been inventoried. Future studies are needed to assess current and future needs for fishing, boating, hiking and whitewater activities.

Boat launch parking. Multiple comments addressed the adequacy of parking and the need for improvements at a number of launch facilities. In general, improvement improve larger parking areas to accommodate maximum loading, provisions for vehicles with trailers, and space to turn around. While these are not generally seen as safety hazards in terms of personnel injury, they are a hazard for equipment, especially as relates to vehicles towing trailers and their need to back them.

Boat ramps. The Ambajejus Lake Boat Launch ramp was felt to be best of class and should be used as a model for upgrades.

**Specific Comments.**

Caribou Lake Put-in and Chesuncook Dam Point Boat Launch. These facilities are only usable about 50% of the boating season. Lake levels need to be more stable and the facilities modified to be functional throughout the boating season (June through September) down to historic low lake levels.

Upper Gorge Trail. Please expand the second bullet with the bolded words to read: Anglers also use this site to access the Upper Gorge, and higher flows in the Upper Gorge **coming from the deep gates** would increase the presence of valuable fish (salmon/trout) targeted by anglers. The trail needs to include informal trails that provide access down to the water for anglers and paddlers – hikers as well.

McKay Station Rafting Station. Current situation is marginally safe at best. Additional rock needs to be added or other measures need to be taken to make water access safer for paddlers, rafters and anglers and less damaging to equipment; a longer-term solution also needs to be found. This comment included as a matter of special emphasis.

Big Amberjackmockamus Launch. Although recently improved, the site is generally poorly maintained despite high use by the whitewater community. The access road is in poor condition and needs maintenance: grading and gravel. Additional parking and turn around space is needed.

Millinocket Lake Boat Launch, Ambajejus Lake Boat Launch and South Twin Lake Boat Launch. All need expanded parking; Brookfield's use of Jersey barriers further restricts parking.

Dead Man's Curve Boat Launch. This launch is unusually steep and needs to be redesigned to be more usable. More parking and an area to turn around are also needed.

Stone Dam Access. Brookfield has stated this will be will all be examined as part of a Level 2 Whitewater Access and Reconnaissance planned for the spring/summer of 2024. This comment is included for emphasis. It is expected that the new license will put water into the main channel of the West Branch below Stone dam. This will provide both fishing and whitewater opportunities. Access must be provided better than the long lake paddle currently available.

**Additional Sites.** The following were not presented to the focus group. The future of the parking provided is unclear. TU requests that they be added to the report. Site location is provided by attached Map 1. Orange pins indicate parking for fishing access.

Telos Bridge Parking Area. Parking provides fisheries access to the pools fishable from the north bank above Telos Bridge. Maintained by MDACF/BPL. Parking considered adequate, future maintenance is a possible issue.

Golden Road Pull-offs. Additional sites providing access to fishable pools from the south side of the Golden Road both upstream and downstream of Telos Road. These are of special concern because Katahdin Forest Management is letting the Golden Road return to gravel as the McAdam surface deteriorates. These pull-offs are not well defined and could be lost in the process unless provision for them is provided.

Holbrook Pull-off. Pull-off space for a couple of vehicles providing access to south shore and to Holbrook Pool. This pull-off is a special concern because it is relatively narrow and logging truck come at relatively high speed down the hill above from the west.

Meadows Pull-off. Pull-off space for a couple of vehicles providing access to south shore and to the Meadows Pool.

Steep Bank Pull-off. Pull-off space for a couple of vehicles providing access to the south shore and to the Steep Bank Pool.

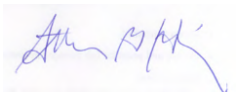
Little Amberjackmockamus Pull-off. Pull-off space for a couple of vehicles providing access to south shore and to the pool below Little A Falls.

Abol Falls Pull-off. Pull-off provides parking for a couple of vehicles off Water Way below the Abol Falls Boat Launch to access the run of water below Abol Falls. Status is unclear. Location is shown on Map 2.

Little Amberjackmockamus Launch Site/Take Out. Boat takeout/put in maintained by MDACF/BPL. Needs additional parking, improvement to side-channel crossing, and gravel added to the access route.

I appreciate this opportunity to provide input on the recreational aspects of the Ripogenus and Penobscot Mills Projects.

Respectfully,



Stephen G. Heinz
3 Spruce Lane
Cumberland Foreside ME 04110
207 781-4762 (voice/fax only)

Map 1
Upper Gorge Boating Access
Upper Gorge Trail Parking
McKay Station Rafting Put-in
Little Eddy Access
Holbrook Pulloff
Meadows Pulloff
Telos Road Parking
Steep Bank Pool Pulloff
Little A Pulloff
Little A Launch Site Access
Big A Access
Big A Launch
Nesowadnehunk Parking

Map 2
Abol Falls Pull-off
Image © 2024 Maxar Technologies
Google Earth

# Attachment B

June 5, 2024

Ms. Debbie-Anne Reese
Acting Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Via online submission to: http://www/ferc.gov**

Subject: **Status of Consultation for Studies for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458)**

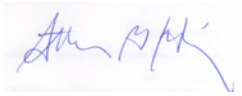
Dear Acting Secretary Reese:

On behalf of its six chapters and over 2,000 members, Maine Council of Trout Unlimited (TU) submits the attached email thread regarding studies for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458) filed for Great Lakes Hydro America, LLC by Brookfield Renewable ("Brookfield" or "Applicant") so that it is part of the record.

TU had asked Brookfield through its contractor Jesse Wechsler for a response to his email regarding consultation and the Ramping Study by May 31, 2024 and that has not been not forthcoming. We reiterate this request.

TU asked at the Updated Study Report Meeting that Brookfield provide the bases for Ripogenus Project flows of 1422 cfs, 1300 cfs and 1000 cfs that are in the current license. Rather than respond to the request, Brookfield stated that it was in the record without reference to where it was located. TU reiterates that request which was included in the attached email.

Respectfully,



Stephen G. Heinz
Maine TU Council FERC Coordinator

**Attachment**

Email thread Stephen Heinz (TU) and Jesse Wechsler (Brookfield)

# Attachment



**From:** **Stephen Heinz** heinz@maine.rr.com
**Subject:** Re: Ripogenus Project Ramping Study Planning
**Date:** May 23, 2024 at 3:03 PM
**To:** Jesse.Wechsler@kleinschmidtgroup.com Jesse.Wechsler@KleinschmidtGroup.com
**Cc:** Tim Obrey Tim.Obrey@maine.gov, John Perry John.Perry@maine.gov, Wendy Bley Wendy.Bley@Kleinschmidtgroup.com, Ed Spear edspear1@yahoo.com, Kyle Olcott dudley_olcott@fws.gov, Randy Dorman randy.dorman@brookfieldrenewable.com, Michael Scarzello Michael.Scarzello@brookfieldrenewable.com, Allan Creamer allan.creamer@ferc.gov, Osborne, Michael michael.osborne@brookfieldrenewable.com

---

Jesse,

Thank you for the clarification.

TU expected be able to conduct substantive discussions of the Ramping Study combined with year two of the Stranding Study at the USR Meeting based on the content of Brookfield's Filing of May 3 that stated: “GLHA looks forward to discussing the study at the USR Meeting." Despite TU noting this at the very beginning of the meeting, no substantive discussion occurred beyond Brookfield stating that the study would likely be delayed until September and that consultation with stakeholders was ongoing. TU had proposed September of early October, the same timeframe that the year 1 Stranding study was conducted. TU supports this later date because milder weather conditions would be less likely to cause mortality of salmon parr and macro-invertebrates, and would not be during the fishing season, but we will not object to conducting it in late July or August. Consultation between Brookfield and TU was minimal for the Stranding Study, but did result in moving some of the study area from areas where strandings were not expected to areas where they were. For the Wadability/Fishability Study, consultation was virtually non-existent: participants were not given key details of the study until they arrived to participate such as specific locations or flows. One of the Brookfield contractors stated at the USR Meeting that none of the volunteers objected to the study methods when it was conducted. It is unrealistic to think that volunteers showing up in the field to participate in a study could do the analysis required in the field on the fly.

The Ramping Study that TU received with your April 26 email assumed TU volunteer participation. TU was not asked if it wished to participate in data collection for the study. TU may want to sample other areas when the study is conducted as we did with the Stranding Study. Conducting relicensing studies is the responsibility of the applicant. TU currently has no paid employees in Maine and any support which we supply is on our members' own time and at their own expense. Few live within easy driving distance of the Ripogenus Project, and most have to find lodging at their own expense to participate in West Branch studies. They are under no obligation to participate and should not be counted on to collect data and certainly without asking if we wished to be used in that manner. We may put independent observers in the field as we did for the Stranding Study where we covered different areas than the formal study did and would appreciate advance notice of its timing and details.

Our participation in the Wadability/Fishability Study was driven by our conclusion that contractor observers would be unqualified to make determinations of either wadeability or fishability over any range of flow. We were not consulted on the details of the study and were disappointed that the range of flows was limited to under 400 cfs. TU’s general comments on the study were that ‘the validity would be dependent on the range of flows provided.’ We anticipated that the three flows that would be provided would cover a larger range. Although bladder systems are not generally used to control flows from dams, Brookfield does use it to control flows within the system to control Millinocket Development ramping rates:

> "Whenever abnormal conditions occur such that a flow cannot be passed through the generators at the Millinocket Powerhouse to achieve the 2,000 cfs minimum flow, the inflatable rubber flashboard system shall be deflated to release flows in an expeditious effort to minimize downriver effects on water quality and aquatic habitat. Except for the initial 2-minute siren warning and a safety flow of 200 cfs for 15 minutes, such flows will not be ramped. The protection of downriver water quality and aquatic habitat is a higher priority than prevention of channel scouring and destruction of vegetation in the Back Channel. During periods of high seasonal flows, the initial 2-minute siren warning and safety flow of 200 cfs for 15 minutes will also be used. Following this 15-minute release, increases of 400 cfs per hour will be made until either the required flow is met, the elevation at Stone Dam is less than 459.45 feet, or the inflatable rubber flashboard system is fully deflated, if necessary. *The ramping up of seasonal flows in the Back Channel will be done only after the hydraulic capacity of those units available has been attained.*” [Source: https://lowimpacthydro.org/wp-content/uploads/2020/07/20190603-Initial-LIHI-Application-Millinocket-Dolby.pdf -page 29, italics supplied].

Less than half the flow that maximized macro invertebrate habitat or adult landlocked salmon habitat that Brookfield Aquatic Habit Study indicated was provided for the Wadability/Fishability Study.

I was surprised that Ed Spear was not included on your April 26 email. Ed has spent more time and done more study of the West Branch fishery than anyone, and his knowledge and experience are invaluable. TU agrees with the comments in his FERC filing of May 1 that supported our requests that the study be conducted in late September or early October. They also reflect TU’s analysis that there is no value in sampling the Big Eddy Pool and alternative sites should be included:

> 'As designed, the RSP includes only about 10 percent of critical salmonid spawning areas (Vol IX 1991 Ripogenus Project Application Table 16) and perhaps a third of salmonid nursey and aquatic insect habitat. This oversight can easily be corrected by including the two flow sensitive areas (either the gravel bar above Line Pool or the relatively long gravel area beginning at the end of Line Pool ) immediately above Nesowadenhunk Deadwater“ and removing the “below Big Eddy Site”. This minor change will include the “Horserace”, prime nursery habitat, and the major spawning areas, Little A Deadwater and the two combined “head of Nesowadenhunk Deadwater” sites. The third major spawning area is the pool immediately below Abol Bridge and is downstream of the reaches of apparent study interest although it is thought to be critical to the North Twin Impoundment salmon population.'

Ed’s comments go on to request inclusion of sampling of macro-invertebrate drift, a key feature of the studies conducted by Smokorowski and others. Incorporating this represents an opportunity to further inform the relicensing, and better determine of the full effects of peaking below McKay station. He goes no to say:

> "Aquatic insects provide critical forage for juvenile salmon and as maintenance food items to adult salmon during summer periods. The RSP addresses aquatic communities only in terms of mortalities. They then continue by quoting Smokorowski et al (2011) implying that they are familiar with work done by Smokorowki, Marty and others on the Magpie and Batchawana Rivers. Impressive work, sponsored by the Licensee.
>
> The Licensee correctly identified Smokorowski and other’s work but failed to include their reports of increased aquatic communities “drift” and population shifts resulting from unramped peaking. The literature is replete with publications concerning aquatic insect drift (or movement) caused by peaking as well as emergency outages. This phenomenon should be addressed in

the RSP. My filing of February 14, 2022 (accession No. 20220214-5027) provided details of impacts resulting from unramped peaking and regulated flows and an accompanying list of peer reviewed references. I see no need to repeat well-known science.

I suggest the RSP be modified and include aquatic community drift before, during, and after flow changes. For all sample sites, duplicate metered, drift nets should be set in a fixed position for two hour periods just prior to flow increases; emptied and set again immediately as flow rises; removed before a flow change, and then reset for a two hour period after flows are increased. As mentioned above, to avoid bias caused by the sometimes crepuscular/diel aquatic insect behavior, sampling should be mid-day."

TU would like to build on Ed's comments. The Ramping Study as written is not a ramping study but an exercise to verify that normal switching between 1, 2 and 3 generator operations does not strand fish. If it shows that stranding does not occur when this happens, then it does not make sense to look at smaller increments of flow change - except at lower flows. As TU stated in its April 30 email:

"TU is still unaware of data supporting the flows that comprise the terms and conditions of the current license. The 400 cfs trip event flows allowed under the current license have been demonstrated to cause extensive mortality to fish and macro-invertebrates. If data exists to justify 1000 cfs as a minimum flow in terms of strandings, then please direct us to the study data that shows that. Similarly, if data exists to justify spawning and incubation flow of 1422 to 1300 cfs, then please direct us to that as well. To our knowledge, the 1422 cfs only reflects the general guidance for minimum flow developed by USFWS for New England waters: the catchment area in square miles. More specific data is needed to condition the new license."

In any case, the scope of the study needs to be expanded to include examination of the range of flows from 1422 cfs down to the 500 cfs that the Stranding Study has conclusively shown to cause extensive mortality, especially to landlocked salmon parr. If this is not incorporated into the Ramping Study, then additional delays to those already caused by the failure go two McKay Station generators on July 8, 2023 will be incurred when it is recognized that the current minimum, spawning and incubation flows are not based on data.

I spoke with Allan Creamer at the USR Meeting on May 16, and he said he had looked and the only flow study he could locate was an IFIM study for Ripogenus Gorge. This is completely the opposite of what Brookfield asserted in response to my multiple requests that Brookfield identify the studies supporting current license flows. We are well into the relicensing process and still lack data justifying the flows in the current license that we expect Brookfield will apply to have continued in the new license.

TU proposed both the Stranding Study and the Ramping Study. We appreciate the opportunity to provide input to the consultation. Please reply by May 31, 2024.

Thanks again,

Steve Heinz
Maine TU Council FERC Coordinator
207 781-4762 (voice/fax only)

> Begin forwarded message:
>
> **From:** Stephen Heinz <heinz@maine.rr.com>
> **Subject: Re: Ripogenus Project Ramping Study Planning**
> **Date:** April 30, 2024 at 8:01:52 AM EDT
> **To:** "Jesse.Wechsler@kleinschmidtgroup.com" <Jesse.Wechsler@KleinschmidtGroup.com>
> **Cc:** Tim Obrey <Tim.Obrey@maine.gov>, John Perry <John.Perry@maine.gov>, Wendy Bley <Wendy.Bley@Kleinschmidtgroup.com>, "Michael.Scarzello" <Michael.Scarzello@brookfieldrenewable.com>, Kyle Olcott <dudley_olcott@fws.gov>, Amanda Cross <amanda_cross@fws.gov>, Jeff Murphy <jeff.murphy@noaa.gov>, Jim Vogel <jim.vogel@maine.gov>, Matt Streeter <mstreeter212@gmail.com>, Laura Paye <laura.paye@maine.gov>
>
> Dear Jesse,
>
> Thank you for including TU in the coordination of the upcoming Ramping Study.
>
> We are surprised that you would choose the weeks of highest aquatic biological activity to conduct the study. The weeks that you propose are during the largest hatches of caddis flies and greatest period of stonefly emergence. The study would perturbate the lifecycle of the insects and the fish that feed on them. Besides that, landlocked salmon fry would be very young then and vulnerable to changes in flow conditions. In mid-June, water temperatures and air temperatures will likely be fairly high so any strandings that might occur would be more likely to result in mortality than if the study were conducted either earlier or later in the year.
>
> These are also the weeks that most Maine trout fishermen want to be on the water, so it is doubtful that TU would be able to recruit enough volunteers to assist with data collection if we supported these dates. Local guide and campground businesses would also likely suffer.
>
> TU proposes that the studies be conducted in late September or early October as we expected would have been done last year.
>
> TU intends to propose a safe flow study be conducted as an adjunct to the Ramping Study and proposes to discuss this at the upcoming USR Meeting in Bangor. TU is still unaware of data supporting the flows that comprise the terms and conditions of the current license. The 400 cfs trip event flows allowed under the current license have been demonstrated to cause extensive mortality to fish and macro-invertebrates. If data exists to justify 1000 cfs as a minimum flow in terms of strandings, then please direct us to the study data that shows that. Similarly, if data exists to justify spawning and incubation flow of 1422 to 1300 cfs, then please direct us to that as well. To our knowledge, the 1422 cfs only reflects the general guidance for minimum flow developed by USFWS for New England waters: the catchment area in square miles. More specific data is needed to condition the new license.
>
> Please provide an email response to this by noon, Monday, May 6.
>
> Thanks again,
>
> Steve Heinz
> Maine TU Council FERC Coordinator
> 207 781-4762 (voice/fax only)

> On May 23, 2024, at 1:06 PM, Jesse Wechsler <Jesse.Wechsler@KleinschmidtGroup.com> wrote:

Hi Steve –

Confirming for you that no additional communication has gone out on this topic and providing you with the latest update.

Per MDIFW's recommendations on May 2, we are now looking to perform the study in back-to-back weeks in the 2nd ½ of July or in August. We anticipate two days of field work (1 day in each week). We are currently discussing the timing with GLHA to make sure that this will work operationally and to identify specific dates for the field work. We also need to make sure that the new timeframe will work for the rafting outfitters.

Per the study plan, we are planning to form teams of three (1 staffer from TU, MDIFW, and GLHA/KA) for each of the three study sites.

This timing should also allow us to include the results of the study in the Final License Application, which is due to FERC by 9/30.

Due to planned outages and MDIFW permit restrictions, we are not able to perform the study in October.

I plan to develop a detailed schedule soon and send it back out to the group.

Thank you!
Jesse

**Jesse Wechsler**
**Senior Environmental Scientist and Project Manager**
**Office: 207-416-1278**
www.KleinschmidtGroup.com
*Providing* **practical** *solutions for* **complex** *problems affecting energy, water, and the environment*

---

**From:** Stephen Heinz <heinz@maine.rr.com>
**Sent:** Wednesday, May 22, 2024 4:14 PM
**To:** Jesse Wechsler <Jesse.Wechsler@KleinschmidtGroup.com>; Tim Obrey <Tim.Obrey@maine.gov>; John Perry <John.Perry@maine.gov>; Wendy Bley <Wendy.Bley@Kleinschmidtgroup.com>; Ed Spear <edspear1@yahoo.com>; Kyle Olcott <dudley_olcott@fws.gov>; Dorman, Randy <randy.dorman@brookfieldrenewable.com>
**Cc:** Michael Scarzello <Michael.Scarzello@brookfieldrenewable.com>; Allan Creamer <allan.creamer@ferc.gov>
**Subject:** Re: Ripogenus Project Ramping Study Planning

All,

At the USR Meeting in Bangor last week, I understood that Jesse Wechsler or Brookfield would get back to us regarding "ongoing consultations" involving the upcoming Ramping Study, and combining it with the rest of the Stranding Study. TU was the organization that proposed both studies.

When I spoke with Dave Scarzello this morning at the FERC DEIS Hearing on the

Shawmut Project in Augusta, he said that something had been sent out earlier this week.

I have looked back through my emails and checked the FERC docket and cannot find any new emails or new FERC filing to the docket related to the Ramping Study.

If an email was sent, please forward it to me at your earliest convenience. TU has inputs.

Thanks,

Steve Heinz
Maine TU Council FERC Coordinator
207 781-4762 (voice/fax only)

On Apr 26, 2024, at 4:44 PM, Jesse Wechsler <Jesse.Wechsler@KleinschmidtGroup.com> wrote:

Good afternoon all,

On behalf of GLHA, I am writing to provide an update and to start coordinating with you on the upcoming ramping study at the Ripogenus Project. As you might recall and as described in documents filed with FERC in 2023 as part of the current relicensing effort, GLHA is planning to study the effects of the following two operational scenarios at the Ripogenus Project on downstream fish and aquatic resources:

- Changing from 3-unit operation (~3,500 cfs) to 2-unit operation (~2,300 cfs) to 1 unit operation (~1,100 cfs) (holding at 2-unit operation for 1 hour before going to 1-unit operation).
- Changing from 3-unit operation (~3,500 cfs) to 1-unit operation (~1,100 cfs) by simultaneously shutting down the other two units.

The study plan, which has been approved by FERC, is attached as reference.

GLHA originally planned to complete the study in the fall of 2023 but was unable to do so because of excess precipitation and scheduled maintenance activities at the McKay Station, which resulted in one or more turbine units being unavailable for the study.

On April 10 of this year, GLHA consulted with members of the rafting

community (i.e., the New England Outdoor Center and other members) at the annual Whitewater Outfitters Meeting to identify dates for the ramping study that would not affect planned recreational and rafting activities in the West Branch. Based on requests from the rafting community and the need to avoid planned maintenance outages this fall, GLHA is targeting this study to occur on two days over back-to-back weeks in June. Specifically, the planned dates are Wednesday June 12 and Wednesday June 19. A target study schedule is attached, showing the planned timeline for operational changes, river flows, and field monitoring activities.

As described in the study plan, the intent is to develop three small field teams that include one representative from TU, GLHA, and MDIFW for each of the 3 sites. We envision this year's study will rely on small teams working together to evaluate the effects of these flow changes on fish and aquatic resources.

As we continue planning the field study, could you please confirm whether your organization will take part, and if so, provide contact information for specific individuals so that we can coordinate directly with team members?

Please feel free to contact me with any questions.

Thank you!

**Jesse Wechsler**
**Senior Environmental Scientist and Project Manager**
**Office: 207-416-1278**
www.KleinschmidtGroup.com
*Providing* **practical** *solutions for* **complex** *problems affecting energy, water, and the environment*

# Attachment C

**Ramping Study**

A Ramping Study would inform the project participants by determining minimum flow changes protective of fish and aquatic communities. The Licensee presently ramps flows below the Caucomgomoc and Brassua Lake Dams. Ramping is commonly requirement in FERC Licensed projects.

**Additional Study Request**

In accordance with 18 CFR 5.15(e), the following is submitted to justify the request.

(1) *Any material changes in the law or regulations applicable to the information request*: there have been no material changes in the law or regulations applicable to this request.

(2) *Why the goals and objectives of any approved study could not be met with the approved study methodology*: No approved study addressed the minimum flows that would preclude or minimize strandings or the rates of achieving those flows that preclude or minimize mortality. TU supported a Ramping Study in its Proposed Study Plan Comments. Information on adequate flows or alternative means of project operations such as ramping to prevent this mortality was not contained in any of the studies included in the ISR.

(3) *Why the request was not made earlier.* Such a study was proposed as a Pre-application Document Comment [Ed Spear letter dated February 12, 2022, Subject: A study Request; Ramping and the Need to Determine the Appropriate Rate of Flow Change Below McKay Station on the West Branch of the Penobscot River] but was not included in the studies FERC approved in its Study Plan Determination (SPD)[ FERC Study Plan Determination for the Ripogenus Hydroelectric Project and the Penobscot Mills Hydroelectric Project dated May 13, 2022, page A-1].

(4) *Significant changes in the project proposal or that significant new information material to the study objectives has become available:*.. The Licensee stated there have been no change in Project operations. This is incorrect. Project operations have changed from relatively base flow for papermaking to a market driven peaking regime. Stranding Study decisively demonstrated that permitted project operations allow abrupt changes in flow that result in significant strandings of fish and macroinvertebrates with significant mortality noted, especially to landlocked salmon parr. This conclusively demonstrated the need for a Ramping Study to determine environmentally safe flows changes and the ramping rates needed to achieve them.

(5) *Why the new study request satisfies the study criteria in § 5.9(b):* The following resubmits the ramping study request in accordance with § 5.9(b).

*1. Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of the study is to determine safe ramping rates as well as minimum safe flows and the ramping rates needed to achieve them.

2*. If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Ramping rate studies are a recognized way to determine ramping rates that reduce or eliminate resultant mortality. Brookfield is well aware of such studies from a multi-year study on ramping effects for the Magpie River Project in Wawa, Ontario since the project is operated by a Brookfield subsidiary. The study is described by Karen E. Smokorowski, Robert A. Metcalfe, Nicholas E. Jones, Jerome Marty, Shilei Niu, and Richard S. Pyrce. Studying Ramp Rate Restrictions, Hydro Review, July 2009.

*3. If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study*.

TU members fish the West Branch of the Penobscot regularly. For many of our members, this is one of our most favored fishing destinations, one that we endeavor to revisit every year. TU has a strong and continuing interest in the terms of the relicensing of the West Branch projects. TU's fisheries interests parallel the general public interest.

4*. Describe existing information concerning the subject of the study proposal, and the need for additional information*.

The Stranding Study demonstrated that an abrupt change from flows of about 2000 cfs to trip event flows of 500 cfs caused significant strandings and mortality, primarily to landlocked salmon parr. The Stranding Study identified areas where dewatering, stranding and mortality occurred. This information can be used to position observers for the ramping study. As stated in the SPD: "As discussed in our recommendations regarding Study 5, the Fish Stranding Study, rapid changes in flow and decreases in water surface elevations can increase the risk of fish and invertebrate stranding that can be stressful and/or lethal for aquatic organisms. As indicated by GLHA, the proposed Historical Operations Data Assessment, would provide information on how the Ripogenus Project is operated, including flows provided by McKay Station. However, it is unclear how this study would determine whether the current rate of downstream flow changes adversely affects aquatic resources or how it would determine the rate at which flows from McKay Station can be ramped up or down to minimize the effects of project operations on aquatic resources." There is no empirical data in the record that documents safe flow change for the Ripogenus Project or the ramping rates needed to achieve them.

*5. Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements*.

Changes in the manner in which flow changes are implemented and the limits on them are needed to improve protection of fish and aquatic communities. Results of the study would directly inform development of terms and conditions of a new license to prevent flow changes at rates that would cause dewatering, stranding and mortality.

6. *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate filed season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

Methodology for ramping studies is well documented in Magpie River Ramping Rate Study, Experiment Design, Fisheries and Oceans Canada (DFO), Great Lakes Laboratory for Fisheries and Aquatic Sciences, Sault Ste. Marie. Ontario Ministry of Natural Resources (OMNR) Great Lakes Power Ltd. (GLPL) July 11, 2002.

The study should be conducted in early October before the effective date of spawning flow restrictions: October 15.

Nominal whitewater flows of 2000 to 2400 cfs should be in effect for a week prior to the study event(s).

Suggested range of flows: 3600 cfs (hydraulic limit) to 500 cfs (trip event flow).

If strandings occurs at the initial rate chosen for the study, result in strandings, the ramping would be repeated on subsequent days at lesser ramping rates until a safe ramping rate was found.

The proposed study methodology is consistent with current practice and consistent with the values of the Penobscot Indian Nation.

7. *Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs*.

Estimated cost is $25,000, consistent with a project of this size and importance. The stranding Study conducted by Brookfield did not meet information ramping goals and are inadequate to inform improved terms and conditions.

| | |
|---|---|
| MEMORANDUM TO: | Public file for the Ripogenus & Penobscot Mills Hydroelectric Projects under Docket Nos. P-2572-133 & P-2458-247 – Maine |
| FROM: | Dan McCaw, Penobscot Indian Nation (Posted by Dustin Wilson, FERC staff) |
| SUBJECT: | Contact information of Dan McCaw for Great Lakes Hydro America |
| DATE: | July 2, 2024<br>[Email dated June 19, 2024) |

Please place the attached email memo in the public file for the Ripogenus & Penobscot Mills Hydroelectric Projects under Docket Nos. P-2572-133 & P-2458-247.

The attached email references information about a letter written by Commission staff to members of the Penobscot Indian Nation and offers Mr. McCaw's contact information to Great Lakes Hydro America.

**From:** Dan McCaw
**To:** Dustin Wilson
**Subject:** Penobscot Mills and RIpogenus
**Date:** Wednesday, June 19, 2024 8:03:04 AM

---

> You don't often get email from dan.mccaw@penobscotnation.org. Learn why this is important

Good morning, Dustin,

I am writing about the May 24th letter written by Stephen Bowler to Chief Kirk Francis, here at Penobscot Nation.

If GLHA would like to contact me, my phone number is below. I am unsure as to what number they have been calling, but I have received no calls or messages from the licensee.

The licensee certainly knows my email, but I have received no messages to date about the referenced study. The Nation is preparing comments on the Study to be submitted before June 3oth.

Sincerely,

Dan

Daniel E. McCaw
Fisheries Program Manager
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, Maine 04468

dan.mccaw@penobscotnation.org
(207) 356-3224

Debbie-Anne A. Reese, Acting Secretary July 13, 2024
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject: Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Comments on the Licensee's June 28, 2024 Updated Study Report Supplement, Filing**

Dear Secretary Reese Via eFile

The implied purpose of the Operation Model (Ops Model) was to determine if environmental, aesthetic, and recreational goals could be implemented while having a degree of compatibility with energy production. The Great Lakes Hydro America's (the Licensee) June 28, 2024 Ops Model as well as earlier filings use a baseline that is based on power production. These data were based on the Millinocket and East Millinocket operation (1999-2002), the East Millinocket operation (2003-2014), and the period in 2015 with 2 closed mills that included a prolonged drought. This variable data set ignored the Rule Curve developed by (then) Great Northern Paper which was the foundation of the 1996 License. While the baseline data set includes minor environmental flow requirements (100 cfs Upper Goal flow July 1-September 30) and boating flow requirements (2000-2300 from 8 AM to 5PM) that vary with the "water year", neither produce any major impact on Ripogenus Project Storage. As long as an energy driven baseline is used, reasonable stakeholder and agency requests that deal with flow or storage will be defeated by the need for market driven energy production

As presented, using power generation as a default, this filing is a continuation of the Licensee's on-going attempt to manipulate data and present results favorable to their market driven energy production. As with the Tributary (salmon) Access and Fish Assemblage Studies, despite highly professional field efforts, subsequent reports, and zoom meetings, parameters set by the Licensee resulted in seriously flawed work products. This filing attempts to outline erroneous assumptions and misuse of data that produced results damaging to Stakeholder and Agency goals.

The Ripogenus and Penobscot Mills Projects and their accompanying Licenses represent two vastly different sets of environmental, aesthetic and recreational arenas. The Ripogenus Project is relatively remote with NO full-time residents (with the possible exception of Chesuncook Village) and other than McKay Station, no industrial development. The Ripogenus Project was once famous for its "world class" West Branch salmon fishery (there is no current quantitative information on its status), white water boating activities, and camping. The Penobscot Mills Project set in the towns of Millinocket and East Millinocket is the exact opposite.

The former Great Northen Paper Mills are now shuttered. Subsequently, the need for constant Hydro power and any linkage between the two Projects no longer exists. Linkage of the two projects creates an artificial burden on the Ripogenus Project and its 30 BCF of storage ability to meet environmental, aesthetic, and recreational goals. These are two separate projects, and two separate licenses. Any (operations) model runs should be made without the bias caused by linking the two projects

In what appears to have been a tactical maneuver, the Licensee filed an Application and accompanying material on the combined Ripogenus and Penobscot Mills Projects . The Licensee needs to explain why they continue to link the Ripogenus and Penobscot Mills Projects. The use of Ripogenus Storage to meet Penobscot Mills power generation should not be included when considering Ripogenus Impoundment elevation and downstream West Branch flow goals. The burden of meeting Penobscot Mills' power production and/or environmental goals lies with North Twin Impoundment and Millinocket Lake storage.

In what appeared to be another tactical maneuver, the Licensee continues to use 939 ft as a Ripogenus Impoundment full pond elevation. As this impoundment routinely reaches 941.6, the licensed elevation, during/after spring runoff, the use of 939 ft is the continuing effort to "hide" three billion cubic feet of storage. Once licensed, the Licensee can fill the impoundment as it wishes, but Ops Model runs should be conducted using a full pond elevation of 941.6 feet

In reading though the Updated Study Report Supplement it appears that elevation and flow values of the R3 models were determined using the synthetic hydrographs of six years (2015-2020) of records (the current operation regime, attachment B) and then model runs were calculated using the synthetic values of the 23-year (1999-2021) period of record. Additionally, as R3 values were the result of one or more calculations, some error statement is needed. It would be helpful if the Licensee could clarify their graphic representations.

As noted above, the Licensee uses the term historic flows (baseline) when analyzing modeling requests. Modeling runs included historic McKay Station flows and these outflows include peaking, low flow events e.g.,1000cfs, and outage events. Inclusion of baseline data and its variability confounds any request for gradual impoundment drawdown and moderate West Branch flows. My request was forward looking, and the Licensee's past operating modes (baseline) have nothing to do with post License operation. My request simply inquired about the possibility of a slower drawdown and moderate flow e.g., 2400 cfs, needed to protect the Holbrook Bypass Channel juvenile salmon production.

The Licensee continues to use estimated inflow derived from distant waters rather than the USGS Gaging Station on the North Branch of the Penobscot River (North Branch) that provides actual inflow into Project impoundments. In-system data must be superior to data derived from distance sources. The Licensee's dismissal of the North Branch is based on two De minimis dams on Dole Brook that provide "regulated" or unnatural flow. However, the Licensee has no problem in classifying Nahmakanta Stream as unregulated (Appendix E-7, 4.0 Methodolgy,) despite the dam on the outlet of Rainbow Lake. The Licensee should clarify when a dam is not a dam.

Current model run outputs are based on change in generation and power production rather than the need to meet resource goals. Despite the fact that McKay spillage provides no danger to the uninhabited West Branch downstream of Ripogenus Dam, the avoidance of spill events remains a major parameter. McKay Station was brought on-line in 1953. Flooding of the West Branch below McKay Station has never been an issue to life or property. On

rare occasions traffic has been inconvenienced. Regarding the Ripogesnus Project, any issue concerning spillage/flooding, is largely irrelevant.

Regarding item one of the above reference filing "HolbrookQByp200Elev8.5", this iteration should not be attributed to me. I made no request to include the Penobscot Mills Project in the analysis . ("*This request severs/delinks any storage need from the Penobscot Mills Project". Filed 02/09/2024).*

The 40 Billion Cubic Feet (BCF) of combined storage along with inflow is adequate to meet flow demands that would water the frequently dewatered Holbrook Bypass Chanel (Article 406). At issue is the impact on Ripogenus Impoundment elevation. One would assume that using a reiterate method, a slightly lower McKay Station annual flow, reduced peaking, would meet Impoundment elevation goals requested by other stakeholders and the agencies

The 1996 Environmental Impact Statement (EIS) stated that agency and stakeholder flow and lake level requests could be generally met, the exception being the historic West Branch Channel (the Back Channel) flow of 350 cfs on dry years. The Licensee needs to explain errors made in the FERC EIS lake elvation and flow conclusions.

Even absent confidence limits around estimates of lost generation, results provided in Updated Study Report Supplement are encouraging. For example , a disciplined peaking operation that reduces McKay Station average outflow by 100 cfs (annually) lessens the demand on Ripogenus Storage by over 3 BCF or three feet in Impoundment elevation. Other methods of meeting environmental concerns exist; including (capital) improvements to the Holbrook Bypass Channel gates that could eliminate the historical flow violation of Article 406.

The Ops Model as presented was devopled by the Licensee and contains many obvious "glitches". Examples include the continued use of flawed inflow data devloped from distant streams, the use of 939 ft as a Ripogenus full pond elevation, the lack of error statements, and the continued linkage of the Ripogenus and Penobscot Mills Projects.

The stakeholders have commented and made directed requests concerning the above "glitches" as well as other lake level, flow and a litany of recreational issues. The Licensee has been consistent in its refusal to modify

the Ops Model. In earlier filings I urged FERC to request a peer-reviewed water management plan or model, one which addresses the needs of all user needs equally. In this filing, I again request an independent model of the project's storage and outflow capabilites. This information will allow FERC to give equal consideration to all the users of the collective resources,

Thank you for opportunity to comment.

Ed Spear

307 Mt Hope Ave
Bangor, Me 04401
edspear1@yahoo.com
Cell: 207-217-4288

"after this period (spring fill) when the impoundment reaches it highest annual level, which typically last for approximately one to two months, the impoundment level is slowly drawn down during the year in accordance with the power system rule curve" 1991 Appplication, Exhibit A, B-12

Section 2.3.1 of 1991 Appplication, Exhibit A states the mean Mckay Station (excluding spillage) flow is 2500 CFS

Nahmakanta Stream discharges into the northern portion of the Pemadumcook Lake basin of the North Twin impoundment. It is an unregulated stream and ungaged, and thus historical flow data are not available 4.0 Methodolgy Appendix E-7

Simulated ***BaselineR3*** and alternative operations scenario ***HolbrookQByp200Elv8.5*** comparison figures and tables

this Baseline scenario is a representation of current Project operations Appendix B-2

Taft Sibley, Chattanooga, TN.
To whom it may concern,

Each year, a group of approximately 40 whitewater kayakers gather to host a world championship competition. In 2021 this group, chose a river feature the Penobscot River which was believed to be world class. Unfortunately, due to irregular flows, the river feature was ideal and the championships had to be moved 1.5 hours down the road to another section of whitewater.

This year, we've chosen to host our event on the Penobscot again and are experiencing the same problem of inconsistent flows. Unfortunately, several of the competitors have chosen to forego the event.

Consistent flows and predictable releases would certainly bring positive impact on the local economy.

Debbie-Anne A. Reese, Acting Secretary July 19, 2024
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

- **Subject: Ripogenus Hydroelectric Project (FERC No. 2572-133) Submittal of West Branch of the Penobscot River 2023 Landlocked Salmon Age-Growth Data**

Dear Secretary Reese, Via Electronic filing

This filing is a revised document to the one that was first filed on September 27, 2023. These revisions largley involved addition of the 2023 landlocked salmon age-growth data.

The age and growth data presented below, represents the 2023 information as well as the previously presented 2022 data. Landlocked salmon (salmon) age and growth distribution of West Branch of the Penobscot River (West Branch) in the river reaches Downstream of McKay Station are shown in the tables below. These data were collected from pools just above Nesowadenhunk Deadwater, the major overwintering area. This reach was popular with anglers in the 1980s and 1990s. Sampling location and methods (angling) are comparable to 1980's West Branch catch data filed in the 1991 FERC Apllication shown in the tables below.

Salmon were collected over a four week period representing seven May sampling events (fishing trips) that typically lasted five hours. As in 2022, the decline in Mayfly hatches eliminated stimulus that might have improved salmon "catchability" and increased the adult salmon sample size. Salmon were caught by fly, landed using a rubber net, measured, and scales removed from the peducle area near the lateral line. When obvious, spawning history (part of the scale margin being absorbed) was noted.

Scale samples were read using a scale projector that produced a magnified image. Age was determined by counting and then measuring annular rings that are formed as the fish begins its yearly growth i.e., normally in May. A number of 2023 fish sample had not yet begun (significant) growth and a new annulus. These fish were assigned the assumed age i.e., treated as if there was an annulus.

Included in the 2022 and 2023 samples were a number of salmons less than 14" (the historic legal size limit). These 2022 fish were not included in the tables of "legal size" salmon shown below. However, based on back-calculated lengths, 2023 sub legal fish are included in a seperate Table below. Juvenile salmon, Ages I and II (Brood years 2019, 2020, 2021) continued to grow at expected rates.

Landlocked Salmon Less Than 14 inches, Angled from the Nesowadenhunk Deadwater Area May, 2023. Lengths are in inches at the time of annulus formation.

| Age | Number | Length At Capture | annulus 1 | annulus 2 | annulus 3 | annulus 4 |
|---|---|---|---|---|---|---|
| 2 | 3 | 11.5 | 4.3 | 10.1 | | |
| 3 | 6 | 12.2 | 3.4 | 9.2 | 12.2 | |
| 4 | 4 | 12.6 | 3.5 | 10.0 | 12.2 | 13.7 |

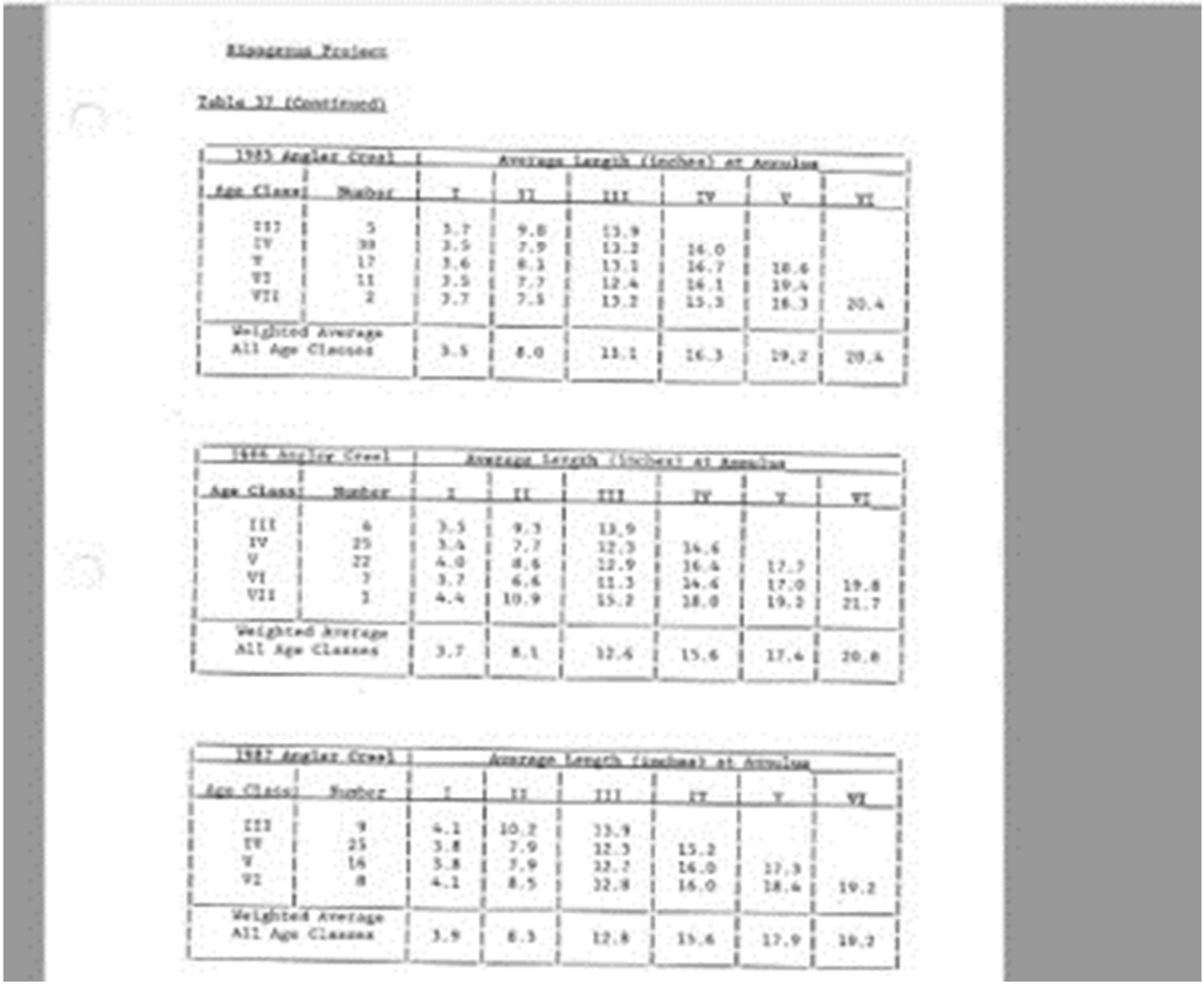
| | Landlocked Salmon Greater Than 14 Inches Angled from the Nesowadenhunk Deadwater Area May, 2023. Lengths are in inches at the time of annulus formation. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| AGE | Ave Length at Capture | Number | AGE ! | AGE II | AGE III | AGE IV | AGE V | AGE VI | AGE VII | |
| IV | | none | | | | | | | | |
| V | 15.6” | 4 | 4.4 | 9.8 | 12.3 | 14.3 | 15.5 | | | |
| VI | 16.2” | 3 | 4.3 | 7.8 | 11.8 | 13.3 | 14.7 | 16.1 | | |
| VII | | none | | | | | | | | |
| | | | | | | | | | | |
| | Average N weighted | | 4.4 | 8.9 | 12.1 | 13.9 | 14.7 | 16.1 | | |
| | | | | | | | | | | |

Landlocked Salmon Greater Than 14 Inches Angled from the Nesowadenhunk Deadwater Area Spring 2022. Lengths are in inches at the time of annulus formation.

| | Number | AGE ! | AGE II | AGE III | AGE IV | AGE V | AGE VI | AGE VII |
|---|---|---|---|---|---|---|---|---|
| IV | 5 | 3.5 | 8.1 | 11.4 | 14.0 | | | |
| V | 3 | 3.6 | 7.0 | 10.6 | 12.6 | 14.1 | | |
| VI | 6 | 3.2 | 6.4 | 10.7 | 13.5 | 15.0 | 16.4 | |
| VII | 1 | 2.7 | 7.5 | 10.0 | 11.5 | 13.2 | 15.6 | 16.9 |
| Average N weighted | | 3.3 | 6.7 | 10.6 | 13.2 | 14.5 | 16.3 | 16.9 |

When compared to 1980’s salmon growth data (see tables shown below), the 2023 West Branch adult salmon population continous to be in a percipitous decline. While Juvenile salmon (ages I and II) grow well, adult fish collected in 2022 and 2023 were typically a year or more behind in growth (rate), one to three inches (depending on spawning

history) when compared to the historic (1985-1987, Rip Application Vol. IX) tablar data shown below. This slow adult salmon growth is most obvious as fish reach their third or fourth growing season and when the absence of suitable food sources e.g., rainbow smelt (smelt), becomes appearent. Salmon that had spawned the prior fall, had not resumed normal (scale) growth pattens. “Spent” adult salmon are, and were historically, the life stage most vulnerable to the absence of suitable food source(s).



Blagdenus Project

Table 37 (Continued)

| 1985 Angler Creel | | Average Length (inches) at Annulus | | | | | |
|---|---|---|---|---|---|---|---|
| Age Class | Number | I | II | III | IV | V | VI |
| III | 5 | 3.7 | 9.8 | 13.9 | | | |
| IV | 39 | 3.5 | 7.9 | 13.2 | 16.0 | | |
| V | 17 | 3.6 | 8.3 | 13.1 | 16.7 | 18.6 | |
| VI | 11 | 3.5 | 7.7 | 12.4 | 16.1 | 19.4 | |
| VII | 2 | 3.7 | 7.5 | 13.2 | 15.3 | 18.3 | 20.4 |
| Weighted Average All Age Classes | | 3.5 | 8.0 | 13.1 | 16.3 | 19.2 | 20.4 |

| 1986 Angler Creel | | Average Length (inches) at Annulus | | | | | |
|---|---|---|---|---|---|---|---|
| Age Class | Number | I | II | III | IV | V | VI |
| III | 4 | 3.5 | 9.3 | 13.9 | | | |
| IV | 25 | 3.4 | 7.7 | 12.3 | 14.6 | | |
| V | 22 | 4.0 | 8.6 | 12.9 | 16.4 | 17.3 | |
| VI | 7 | 3.7 | 6.6 | 11.3 | 14.6 | 17.0 | 19.8 |
| VII | 1 | 4.4 | 10.9 | 15.2 | 18.0 | 19.3 | 21.7 |
| Weighted Average All Age Classes | | 3.7 | 8.1 | 12.6 | 15.6 | 17.4 | 20.8 |

| 1987 Angler Creel | | Average Length (inches) at Annulus | | | | | |
|---|---|---|---|---|---|---|---|
| Age Class | Number | I | II | III | IV | V | VI |
| III | 9 | 4.1 | 10.2 | 13.9 | | | |
| IV | 25 | 3.8 | 7.9 | 12.3 | 15.2 | | |
| V | 16 | 3.8 | 7.9 | 12.7 | 16.0 | 17.3 | |
| VI | 8 | 4.1 | 8.5 | 12.8 | 16.0 | 18.4 | 19.2 |
| Weighted Average All Age Classes | | 3.9 | 8.3 | 12.8 | 15.6 | 17.9 | 19.2 |

Intellectual integrity requires I note that salmon in  upstream reaches e.g., the Little Eddy, closer to McKay Station in the June to Sptember period are typically slightly larger than Nesowadenhunk Fish as they are closer to any tailwater effects. However these “upriver” fish would only have been a small component of historical data sets. The Licensee has, or should have, archival fisheries data sheets.

The comparison between 2022- 2023 and 1985-1987 data demonstrates the diasterous reduction in salmon growth rates brought on by the change in project operations. Juvenile smelt, the primary food source of adult salmon, abundance has declined if not disappeared in recent years. The West Branch is no longer the world class fishery FERC described in the Enviromental Impact Statement of 1996.

The Stakeholders have argued for more stable littoral areas to be provided by slower impoundment drawdowns during the growing season, May1 -October 15. The 2023-2024 water year conditions were notably better than aquatic communities' condition during the spring 2021-spring 2023 period. During the last 13 months the Ripogenus Impoundment stayed fuller and for a longer period. Because of this factor, it is likely that these conditions will be manifested in improved salmon growth when 2024 West Branch and Ripogenus Impoundment data are analyzed.

The Licensee has constantly repeated the theme that nothing has changed regarding the shift to peaking operations and earlier drawdowns. The Licensee has fought all study requests that would provide current fish and aquatic communities data that could be compared to information in the 1991 FERC Application. Information presented in this filing demonstrates the fallacy of this pipe dream/negoiating position. Clearly the Ripogenus Project is not meeting MeDIFW fisheries managemnt goals or MeDEP water quality standards.

The Licensee's June 2021 PAD referenced "data gaps", actually voids. These issues remain unchallanged and unchanged. I continue to urge FERC staff to require the Licensee to collect information on Ripogenus smelt (e.g.), plankton, smelt spawning success, food requirements, habitat availablity (littoral areas), as well as downstream smelt drift. This information would provide a course of action that could require modification of future project operations. The West Branch salmon population needs juvenile smelt as a forage base.

Thank you for the opportunity to present these data.

Ed Spear
307 Mt Hope Ave.
Bangor, Me 04401
Email: edspear1@yahoo.com
Phone: 207-217-4288

Brookfield
Renewable U.S.

July 22, 2024

***Via eFiling***

Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Operations Model Run Results – Supplemental Information**

Dear Acting Secretary Reese:

Great Lakes Hydro America, LLC (GLHA), the Licensee of the Ripogenus Hydroelectric Project (FERC No. 2572) and the Penobscot Mills Hydroelectric Project (FERC No. 2458) (collectively referred to as the "Projects"), herein files with the Federal Energy Regulatory Commission (FERC) supplemental information associated with the Operations Model Study for the relicensing of the Projects. The Projects are located on the West Branch Penobscot River and Millinocket Stream in Piscataquis and Penobscot counties, Maine.

On June 11, 2021, GLHA filed the Notices of Intent and a Pre-Application Document, which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through FERC's Integrated Licensing Process (ILP). Per the Operations Model Study, GLHA developed an Operations Model to evaluate alternative operating scenarios for the Projects.

On June 28, 2024, GLHA filed with FERC the model run results for the stakeholder-requested alternative operating scenarios evaluated by the model. On July 10, 2024, GLHA conducted a virtual meeting with interested stakeholders to explain the operations model run results that were filed with FERC on June 28, 2024. Per stakeholder request during the July 10, 2024 meeting, GLHA herein files a copy of the information presented during the July 10, 2024 meeting.

Concurrent with this filing, GLHA is providing a copy of this letter to all parties listed in the attached distribution list. Parties can download an electric copy of this filing from FERC's eLibrary system at https://www.ferc.gov/ferc-online/elibrary by conducting a search using the docket numbers P-2458 and/or P-2572.

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

If you have any questions regarding this letter, please contact me by phone at (315) 566-0197 or by email at michael.scarzello@brookfieldrenewable.com.

Sincerely,



Michael Scarzello
Manager, Licensing
Brookfield Renewable U.S.

cc: Relicensing Distribution List

Enclosed: Operations Model Run Results – Supplemental Information

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Pre-Application Document
Distribution List

**Federal Agencies**

Rachael Mangum, MA, RPA
Assistant Director
Federal Permitting, Licensing, and Assistance Section
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001

Glori James-Suarez
Realty Specialist
Northeastern States
Bureau of Land Management
250 E. Wisconsin Avenue, STE 1100
Milwaukee, WI 53202

Jarrett Devine
Deputy Administrator
Region 1
Federal Emergency Management Agency
PO Box 10055
Hyattsville, MD 20782-8055

Lori A. Ehrlich
Region 1 Administrator
Region 1
Federal Emergency Management Agency
PO Box 10055
Hyattsville, MD 20782-8055

Debbie-Anne A. Reese
Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
19 West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Maine Project Office
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

Leonard Rawlings
FERC Coordinator
Eastern Region
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Joseph Bishop
Water Division Hydro Coordinator
New England Region
U.S. Environmental Protection Agency
5 Post Office Square
Boston, MA 02109

Karen McGuire
New England Region 1
Deputy Regional Administrator
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Kyle Olcott
Hydropower Coordinator
Maine Field Office
U.S. Fish and Wildlife Service
306 Hatchery Road
East Orland, ME 04431

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

**State Agencies**

Ryan Gordon
State Geologist, MGS Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
93 State House Station
17 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Laura Paye
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Erin Wilson
Coastal Policy Specialist
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Peter Jamieson
Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
40 Western Avenue
E.S. Muskie Federal Building, Room 412
Augusta, ME 04330

Stacey Guerin
State Senator
3 State House Station
Augusta, ME 04333

Kathy Irene Javner
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, Maine 04333

Trey Stewart
State Senator
3 State House Station
Augusta, ME 04333

James Lee White
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, ME 04333-0002

**Native American Tribes**

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Rena Newell
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

**Additional Parties**

Dr. Andrew Fisk
Northeast Regional Director
American Rivers

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Jesika Lucarelli
Great Mountain Guide Service

Mark Nadeau
International Association of Machinists
245 Pamola Park
Millinocket, ME 04462

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Arthur Dickey
Maine Rafting Expeditions

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing

Matt Polstein
New England Outdoor Center

Jim Murton
North Country Rivers

Jeremy Hargreaves
Northeast Whitewater

Derek Heady
Northeast Whitewater

Suzie Hockmeyer
Co-founder
Northern Outdoors, Inc.
1771 US Rt 201
The Forks, ME 04985

Emily Yearwood
Northern Outdoors, Inc.
1771 US Rt 201
The Forks, ME 04985

Michael Smith
Outdoor Sport Institute
176 Highland Ave
Millinocket, ME 04462

Kenny DeCoster
Vice President
Penobscot Paddle and Chowder Society

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Amanda Williams
Representative for Allagash Gateway Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Pre-Application Document
Distribution List

Tom Tyler
President
Sportsman's Alliance of Maine
205 Church Hill Road
Augusta, ME 04330

Jimmy Doria
Three Rivers Whitewater

Neil Hagstrom
Trout Unlimited

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,

Dean Beaupain

Jeff Fayle

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

George Forgette

Peter Forti

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Christopher Howe

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Philip Hulbert
895 Brickhouse Hill Rd
East Meredith, NY 13757

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Jim Murton

Charles Paone

Richard Parkes

Edward Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Robert Van Deventer

Wes Zemrak
2 Brookside Drive
Falmouth, ME 04105

July 29, 2024

Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject: Ripogenus Hydroelectric Project (FERC No. 2572-133) Draft License Application Comments.**

Dear Acting Secretary Reese,

The following comments on the Draft License Application (DLA) for Ripogenus Project (P-2572-133) are submitted on behalf of members of the Caribou Chesuncook Lake Camp Associations. These comments are in addition to and supplement the comments we have submitted jointly with other stakeholders. These associations represent individuals with a significant investment in time, treasure and commitment to Chesuncook, Caribou and Ripogenus Lakes. Many multigenerational families are part of this stakeholder group. We have extensive experience with and knowledge of the Lakes. Our stakeholder group also includes members of the Maine Wilderness Guides Association, fishing guides, commercial guiding businesses, and other recreational users of the lakes. I have been involved in the ILP since the initial PAD was presented and I, or my wife, have attended every possible stakeholder meeting.

The DLA was a profound disappointment. In the fast-changing world of technology and energy generation it was disappointing to see one of the biggest participants in the energy field not design a more inspiring license. Nothing new and creative was presented. At the USR meeting we learned that incomplete DLA's are often submitted due to the progress of different studies and were promised a more visionary License Application in the future. I hope this is true.

As in previous filings, the applicant did not acknowledge project impacts and instead painted a rose-colored picture of the project and its operations, despite having been proven inaccurate multiple times. One of the most egregious claims is that lake levels are "*gradually drawn down over the summer,*" on Chesuncook, Ripogenus and Caribou Lakes. The mean drawdown from 2000 - 2022, during the recreational season (May–September) excluding the four wettest and four driest summers, is **11.91 feet**. This significant drawdown of nearly **3 feet per month** is close to the previous licensee's drawdowns of **3.45 feet the entire summer** as stated in their license application, "*an average drawdown of the Ripogenus Impoundment during the recreation season from 1972 to 1985 was **3.45 feet**."* This is a gradual drawdown. Nearly 12 feet—at 3 feet per month—is not.

In 2020, a dry year, the lake dropped over 5 feet a month from June 30 (936.07) to July 31 (931.5). In 2017, a wet year, the drop from July 31 (939.12) to August 31 (935.1) was 4 feet in one month. These precipitous drops are not anomalies. They occur too often. A drop of more than 1-1.5 feet per month is too much.

Other glaring concerns in the application include, but are not limited to:

1. The applicant makes great assumptions to support their purpose when addressing "Reasonable Cost and Availability of Alternative Sources of Power," stating *"The replacement of energy and capacity provided by the Projects would be met through other sources, likely to be fossil-fired generating units, whose fuel and other variable costs would be significantly higher than those of the Projects over the life of the new licenses."* Claiming fuel replacement is "*likely to be fossil-fired generating*" is an implication designed to create concern. The ISO New England Overview and Regional Update presented to the Maine Legislature in January 2023 predicts coal and oil will not be contributors to the energy mix by 2040 and contributed less than 1% in 2021. The applicant must know this, yet used the threat of fossil fuels as a scare tactic. This insincerity is concerning.

2. There are contradictions between claimed flood control capability and the Operations Models. In section 2.13.1 "Existing and Planned Operation of the Projects During Flood Conditions," the applicant is confident of their ability to manage flooding, stating "*Gate operations are started when the Ripogenus impoundment water level approaches, and would be expected to exceed, the normal full pond elevation of 941.59 feet. If the impoundment elevation continues to rise, one or more of the fourteen quick-release stoplog bays would be opened, although this has never been necessary at the Ripogenus Project."* Despite this confidence and clear ability to manage high flows, the applicant insists on using 939 feet as full pond in the Operations Model to protect from flooding downstream, giving up five billion cubic feet of storage capacity.

3. The applicant does not acknowledge littoral zone and shoreline environment changes when stating, *"Ripogenus.. is exposed to wind and waves that are typical of large Maine lakes and, therefore, not conducive to the growth of aquatic vegetation."* This image from July 2024 (936') shows, aquatic and shoreline vegetation is abundant, unlike the rocks that were once there.



4. Claimed environmental mitigation measures are not occuring. In section 5.1 "Existing Environmental Measures" the applicant promises to "*Deploy artificial loon nesting platforms on the Ripogenus impoundment.*" As was shown earlier in the process, the platforms may be deployed but do not appear to be maintained or monitored as these images, taken on July 22, 2024 when the lake is approximately 6.5 feet down (935.7 feet elevation) clearly show.





Sites 5 and 7 from the 2022 Loon Nest Site Map provided in the Loon Study

5. There are severe adverse impacts on water quantity from lake level drawdown despite the applicants claim of *"no unavoidable adverse impacts to water quantity or water quality that occur under the existing and proposed operation of the Ripogenus and Penobscot Mills Projects"* Our previous PAD, Historical Ops Study, ISR and USR comments clearly demonstrate the adverse impacts that are indeed avoidable. Operations make a difference. For example, 2013 was a dry/average year (per FERC) with an inflow of 2,502 units and the project was able to produce 238,835 megawatts (mw) while keeping the lakes up to 935 feet through September 30. In contrast, 2014 was an average hydrological year with an inflow of 2,690 units, yet produced only 224,936 mw of energy (13,899 mw less energy) and left the lake two feet lower in September. Operations do have impacts.

The recent Operations Models also show other operational strategies that could help avoid adverse impacts. The applicant has shown the operational ability, when required by a license, to maintain lake levels within 1.5 feet of spill crest during the summer months (see graphs in the Operations Model Study for North Twin Lake).

6. The applicant continues to claim "*Ripogenus Impoundment is managed for downstream requirements."* Ripogenus Dam is managed for power production. The licensee directly decides how much water is released downstream and hence the impacts. The licensee released between 3,200 to 3,500 cubic feet per second (cfs) from North Twin from June 18-28, twenty-four hours a day, and again July 18-19. This week, 2,200 cfs is scheduled—the license requires 2000 cfs. This extra water is coming from Chesuncook, Caribou and Ripogenus Lakes, which are already nearly 7 feet down, less than halfway through the recreational season. This is lower than GLHA's July 1 Target Elevation of 939 feet. The Caribou boat landing is unusable, according to the applicants Recreation Study results, and the Chesuncook Dam launch is difficult to use. Downstream requirements are dictated by upstream decisions. As has been shown in the Operations Model and other submissions, it IS possible to manage Ripogenus in a manner that maintains relatively stable lake levels and produces energy without dramatically negatively impacting project lakes.

7. The applicant fails to acknowledge the Cumulative Effects (6.1) of significant drawdowns on the lakes above Ripogenus Dam, which are profound and have been documented in numerous submissions, including our most recent USR comments. For the applicant to deny this reality is disturbing. Fortunately, the Operations Model clearly shows that the pre-2012 historical operations, with more stable water levels, remains a sustainable solution for all parties.

8. Boat launch status and use of data are misleading. The DLA claims, *"On average, recreation users indicated they were satisfied with the sites, that the overall condition of the sites was between neutral and good, and that they would return to the site…."* The numerous comments about the impact of low water are ignored. One needs only to glance at the user comments from the recreational user surveys to know low water negatively impacted user experience.

9. The application misrepresents historical data. The DLA claims "*hourly impoundment elevation data from May 1 to November 30 of 2010 to 2022"* indicates "*the Chesuncook Dam Point Boat Launch (is usable) approximately 70 percent of the time"and "the Caribou Lake Boat Launch, approximately 35 percent of the time."*

The above claim grossly extends the recreational season to the end of November and blurs the reality of the data. When assessing boat launch usability, **the date boat landings become unusable** is what matters. If one trusts that the boat landing usability in the Recreation Study is accurate, and using data provided by Brookfield from 2010 - 2022, the Chesuncook Dam boat landing has been **unusable:**

- 77% of the time on October 15 (10 out of 13 years )
- 31% of the time on August 31 (4 out of 13 years)
- 23% of the time on July 30 (3 out of 13 years)

Using data from 5 recent years (2018-2022), the results are more alarming:

- 100% of the time on October 15
- 40% of the time on August 31 (2 out of 5 years)
- 40% of the time on July 30 (2 out of 5 years)

The Caribou boat launch was **unusable 75% of the time on August 1st.**

These numbers are unacceptable. The people of Maine have the right to access their waters 100% of the recreational season.

10. The applicant justifies limiting access to Chesuncook, Caribou and Ripogenus Lakes for a large demographic of users, stating,*"When the impoundment elevation is below the usable levels…both boat launches remain usable for small, trailered boats and hand carry boat access."* It is unsafe, unreasonable and unwelcoming to expect a recreationist accessing a State of Maine lake to drag a boat 150 feet or more over a slippery, rock-strewn shoreline to access the third largest lake in Maine. A boat that needs to be trailered is not meant to be carried. Many users are not able to hand carry boats to the water and many users on the lakes are people fishing from motorboats, which cannot be carried. The size of the trailers in these images from July 2024 prove these boats could not be carried to the water:





Goal 4 of Maine's 2012-2035 Statewide Fisheries and Hatcheries Management Plan seeks to provide safe, reliable access in stating, *"Encourage, and where possible provide, fair, equitable, safe, and permanent access to Maine's public waters for fishing and boating."* The applicant has a responsibility to provide access to project waters throughout the entire recreational season. Furthermore, **if water at the boat launches is too low for launching, the water is also too low to safely navigate between lakes,** as is shown in previous submissions.

11. The applicant inaccurately claims if operations were kept the same, "*there would be no effect on views from the KOPs or the aesthetics in and around the Project."* Again, this statement has been proven false in multiple submissions and was negated in the applicants own Aesthetics Study, which documented a decrease in the VMI Rating at lower water.

12. The applicant improperly and inaccurately takes responsibility for the aesthetic beauty of the area and the public's ability to view it.

*a.* The applicant states, "*the Projects provide public access from their multiple recreation sites for the public to access and view the scenery in and around Projects."* This is true – to a point. The applicant is required to provide public access; a requirement that has not been met numerous times in the past years. The public has had great difficulty accessing the project waters, and there has been little to no maintenance completed. Access is often unnavigable, unsightly and unsafe.

*b.* The applicant goes on to say, *"the Project impoundments are well known as recreation areas and for their aesthetic character, offering outstanding views of nearby mountain ranges including the tallest mountain in Maine Mount Katahdin."* This is true, but has nothing to do with the project's operations and cannot be credited to the applicant.

*c.* When discussing KOP's, the applicant says, "*A major contributor to the high aesthetic ratings at all KOPs were Project waters. These high ratings throughout the Projects suggest that the impoundments themselves and existing flows into riverine reaches help create and influence the high aesthetic character of the area."* The water is beautiful, but this does not make the applicant responsible for the aesthetics at the KOP's. These waters were here well before the project. All the lakes (except Dolby) within project boundaries existed as natural lakes since the last glaciers receded and have been used by people since that time. Without the project, the lakes would be both accessible and not have the significantly negative impact of drawdowns. The project is not responsible for the aesthetics of the area or the use of these waterways. The Wabanaki people have used these waters for thousands of years!

*d.* On Page 583 the applicant boasts, *"Based on the high aesthetic ratings from the KOPs around the Ripogenus impoundment, Project operations positively affect aesthetics."* This nebulous statement does not explain how such an assumption is justified. In fact, as has been proven in our previously submitted comments and the applicant's own studies, project operations **do** negatively impact aesthetics. To ignore this fact in a license application is deeply irresponsible and disturbing.

12. The applicant distorts data to present information. For example, they claim, *"Historically during the recreation season median monthly elevations range between 3 and 10 ft below normal full pond elevation."* As is explained in greater depth in our Historical operations comments, the impact of drawdowns needs to be evaluated by the date upon which impacts occur. Please see our Historical Ops comments for specific facts on this.

As a leader in hydropower production, it is concerning that the licensee has no visionary plans other than maintaining the status quo. Operating the projects under the old license is simply looking backward. The time has come to look forward to new technologies, new operational strategies and a new vision for the project. A new license needs to be developed with creative solutions and collaborative problem solving.

To help create this new license and provide *"(1) angling and recreational access/opportunities on the project impoundments (including Caribou, Chesuncook, and Ripogenus Lakes) and the West Branch; (2) public safety of recreational users of the lakes; (3) water supply to properties around Ripogenus Impoundment;"* as suggested in the DLA, we suggest and respectfully ask:

1. The lakes above Ripogenus Dam will be refilled to full pool elevation of 941.6' (944' GNP datum) +/-1 foot by May 15, then drawdown at a rate no more than 1 foot every 28 days until October 15. This meets loon nesting requirements, protects aquatic and shoreline communities, mirrors current plans for other project lakes and will ensure water is available throughout the summer months for fishing, generation and recreation needs. This request also potentially meets or restores ME DEP water quality standards and mirrors the GLHA Water Use Plan in the current license.

2. A maximum 1 foot drawdown per month until October 15 achieves a minimum lake level of 935.6' (938' GNP datum) on October 15. This is close to the level the applicant used for the KOP comparison in 2023. This level was accomplished in 2013, a dry/average year, while still generating 238,835 mw. This level also keeps lakes relatively full during the recreational season with all of its accompanying benefits, provides safe access to project waters and preserves the aesthetic beauty of the area. Maintaining this level will provide habitat conditions at the confluence of Umbazookus Stream suitable for Lake Whitefish spawning activities: staging, spawning, and post spawning out migration. Nearby Allagash Stream offers adult Lake Whitefish as a donor source. Therefore, a small undetected relic population may exist, and this elevation provides an opportunity for natural recolonization. Most importantly, it is supported by the Ops Model.

3. Impoundment elevations for all sites (including storage ponds) are reported on Safe Waters. Lake boaters need to know this information to plan for safe navigation within and between lakes and be able to anticipate the condition of the boat landings. Camp owners and users of public campsites need this information to plan for packing and gear organization. This is public information currently available for North Twin and Millinocket Lakes, and needs to be available for all project lakes.

4. A mechanism be put in place to assess and report to FERC and the public, mid-winter snowpack, long and short term weather forecasts and lake elevations to determine if operations need to be modified (i.e., reduced outflow) to secure enough water for spring refill to 941.6 feet (944' GNP datum). Winter drawdown below elevation 925.1 feet will only be allowed in "wet years" based on a mid-winter notification process.

5. Develop a "Rule Curve" that allows for a low water year plan that protects all stakeholders and sets minimum lake levels for all project lakes. Impacts of low water years must be absorbed by all stakeholders.

Given the significant changes in the project from the last license, the applicant is essentially seeking a new license. The license should be viewed with a new set of eyes that consider the future of energy, recreation within the project area, the history and culture of the area and the aquatic and shoreland communities that make their home here. Guardrails are needed in the license to assure available water to all project lakes and rivers and to protect all users. We again submit it is possible to define a balanced license that recognizes and includes all stakeholders. We hope the applicant's Final License Application will reflect this.

Thank you for the opportunity to submit and for your continued diligence in seeking an understanding of the larger picture and impacts of project operations so a balanced license can be created.

Respectfully,

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Associations
PO Box 145
Kingfield, ME 04947
bhoustonps@gmail.com

Brookfield
Renewable U.S.

July 30, 2024

***Via eFiling***

Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Response to Comments on the Updated Study Report and Requests for New or Amended Studies**

Dear Acting Secretary Reese:

Great Lakes Hydro America, LLC (GLHA), the Licensee of the Ripogenus Hydroelectric Project (No. 2572) and the Penobscot Mills Hydroelectric Project (No. 2458) (collectively referred to as the "Projects"), herein files with the Federal Energy Regulatory Commission (FERC) responses to comments on the Updated Study Report (USR) and requests for new or amended studies for the Projects. The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot counties, Maine.

On June 11, 2021, GLHA filed the Notices of Intent and a Pre-Application Document (PAD), which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through FERC's Integrated Licensing Process (ILP). On March 23, 2022, GLHA filed a Revised Study Plan (RSP) for the Projects, and the Commission issued the Study Plan Determination (SPD) on May 13, 2022. GLHA performed study activities in 2022 with available results provided in the Initial Study Report (ISR) filed with FERC on April 24, 2023. Subsequent to the filing of the ISR, stakeholders filed comments on the ISR and new study requests, and on September 19, 2023, FERC issued the second SPD. GLHA performed continued study activities in 2023 for which available results were provided in the USR filed with FERC on April 22, 2024. Additional studies are ongoing in 2024.

GLHA has reviewed the stakeholder comments on the USR and requests for new or amended studies as filed with FERC and herein provides responses to these comments and requests.

Concurrent with this filing, GLHA is providing a copy of this letter to all parties listed in the attached distribution list. Parties can download an electronic copy of this filing from FERC's eLibrary system at https://www.ferc.gov/ferc-online/elibrary by conducting a search using the docket numbers P-2458 and/or P-2572.

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

If you have any questions regarding this information, please contact me at Michael.Scarzello@brookfieldrenewable.com.

Sincerely,



Michael Scarzello
Manager, Licensing
Brookfield Renewable U.S.

cc: Relicensing Distribution List

Enclosed: Responses to Comments on the USR and Requests for New or Amended Studies

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Pre-Application Document
Distribution List

**Federal Agencies**

Rachael Mangum, MA, RPA
Assistant Director
Federal Permitting, Licensing, and Assistance Section
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001

Glori James-Suarez
Realty Specialist
Northeastern States
Bureau of Land Management
250 E. Wisconsin Avenue, STE 1100
Milwaukee, WI 53202

Jarrett Devine
Deputy Administrator
Region 1
Federal Emergency Management Agency
PO Box 10055
Hyattsville, MD 20782-8055

Lori A. Ehrlich
Region 1 Administrator
Region 1
Federal Emergency Management Agency
PO Box 10055
Hyattsville, MD 20782-8055

Debbie-Anne A. Reese
Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
19 West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Pre-Application Document
Distribution List

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Maine Project Office
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

Leonard Rawlings
FERC Coordinator
Eastern Region
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Joseph Bishop
Water Division Hydro Coordinator
New England Region
U.S. Environmental Protection Agency
5 Post Office Square
Boston, MA 02109

Karen McGuire
New England Region 1
Deputy Regional Administrator
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Kyle Olcott
Hydropower Coordinator
Maine Field Office
U.S. Fish and Wildlife Service
306 Hatchery Road
East Orland, ME 04431

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

**State Agencies**

Ryan Gordon
State Geologist, MGS Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
93 State House Station
17 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Laura Paye
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Erin Wilson
Coastal Policy Specialist
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Peter Jamieson
Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
40 Western Avenue
E.S. Muskie Federal Building, Room 412
Augusta, ME 04330

Stacey Guerin
State Senator
3 State House Station
Augusta, ME 04333

Kathy Irene Javner
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, Maine 04333

Trey Stewart
State Senator
3 State House Station
Augusta, ME 04333

James Lee White
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, ME 04333-0002

**Native American Tribes**

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Rena Newell
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

**Additional Parties**

Dr. Andrew Fisk
Northeast Regional Director
American Rivers

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Jesika Lucarelli
Great Mountain Guide Service

Mark Nadeau
International Association of Machinists
245 Pamola Park
Millinocket, ME 04462

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Arthur Dickey
Maine Rafting Expeditions

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing

Matt Polstein
New England Outdoor Center

Jim Murton
North Country Rivers

Jeremy Hargreaves
Northeast Whitewater

Derek Heady
Northeast Whitewater

Suzie Hockmeyer
Co-founder
Northern Outdoors, Inc.
1771 US Rt 201
The Forks, ME 04985

Emily Yearwood
Northern Outdoors, Inc.
1771 US Rt 201
The Forks, ME 04985

Michael Smith
Outdoor Sport Institute
176 Highland Ave
Millinocket, ME 04462

Kenny DeCoster
Vice President
Penobscot Paddle and Chowder Society

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Amanda Williams
Representative for Allagash Gateway Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Tom Tyler
President
Sportsman's Alliance of Maine
205 Church Hill Road
Augusta, ME 04330

Jimmy Doria
Three Rivers Whitewater

Neil Hagstrom
Trout Unlimited

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,

Dean Beaupain

Jeff Fayle

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

George Forgette

Peter Forti

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Christopher Howe

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Philip Hulbert
895 Brickhouse Hill Rd
East Meredith, NY 13757

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Jim Murton

Charles Paone

Richard Parkes

Edward Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Robert Van Deventer

Wes Zemrak
2 Brookside Drive
Falmouth, ME 04105

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, DC 20426
July 31, 2024

OFFICE OF ENERGY PROJECTS

Project Nos. 2572-133 & 2458-247 –
Maine
Ripogenus Hydroelectric Project
Penobscot Mills Hydroelectric Project
Great Lakes Hydro America, LLC

**VIA FERC Service**

Mr. Michael Scarzello, Licensing Manager
Great Lakes Hydro American, LLC
c/o Brookfield Renewable U.S.
399 Big Bay Road
Queensbury, New York 12804

**Reference: Staff Comments on Draft License Application**

Dear Mr. Scarzello:

On May 3, 2024, you filed a draft license application (DLA) with the Federal Energy Regulatory Commission for the relicensing of the Ripogenus and Penobscot Mills Hydroelectric Projects. We have reviewed the DLA, and provide our comments in the enclosed Schedule A.

Please contact Allan Creamer at (202) 502-8365, or at allan.creamer@ferc.gov, if you have any questions.

Sincerely,

Stephen Bowler, Chief
South Branch
Division of Hydropower Licensing

Enclosure: Attachment A – Staff's Draft License Application Comments

## Attachment A – Staff's Draft License Application Comments

### Protection, Mitigation, and Enhancement (PM&E) Measures

1. Section 5.18(b)(5)(ii)(C) of the Commission's regulations requires that all of an applicant's proposed environmental measures must be provided in the final license application (FLA).[1] Section 5.2, *Proposed Environmental Measures*, of Exhibit E of the draft license application (DLA) states that Great Lakes Hydro American (GLHA) proposes to continue to operate and maintain the Ripogenus and Penobscot Mills Hydroelectric Projects (collectively, the Projects), and to implement environmental PM&E measures as described in the DLA for the term of the Projects' new licenses. However, the DLA contains no PM&Es. GLHA's FLA must include all of the proposed PM&E measures for review by Commission staff and stakeholders, with sufficient information to inform an economic and environmental analysis of each proposed PM&E. Therefore, please include in the FLA, all proposed measures, including drafts of all proposed plans or a description of the conceptual elements of the plans, as well as cost estimates for the measures and/or plans. The consultation record filed with the FLA should demonstrate that GLHA considered stakeholder recommendations and comments, as well as explain, in detail, why stakeholder's recommendations are or are not adopted as part of the proposed action for the Projects.

### Exhibit B – Project Operation

2. In order for Commission staff to complete its economic analysis of each relicensing alternative (*i.e.,* no action, applicant's proposal, staff alternative, and staff alternative with mandatory conditions), please provide, in the FLA, the median monthly flow duration at the Projects' dams (in graphic and tabular form) for an average flow year.

3. Appendix B of the DLA provides the annual and monthly flow duration curves for the West Branch at the Ripogenus Project and the North Twin development of the Penobscot Mills Project. Please provide the tabular data for these graphs in the FLA.

[1] *See* Guidance on Environmental Measures in License Application; available at https://www.ferc.gov/sites/default/files/2020-04/GuidanceonEnvironmentalMeasuresinLicenseApplications.pdf.

**Exhibit E – Environmental Resources**

*General Comments*

*4.* The DLA includes maps of the project areas showing various geographic information system (GIS) data collected during the prefiling studies conducted by GLHA and its consultants. To facilitate review of the data collected on environmental resources at the Projects, please file the GIS shapefiles associated with the studies with the FLA.

*Aquatic Resources*

*5.* Section 5.1, *Existing Environmental Measures*, of Exhibit E of the DLA describes the existing flows released from McKay Station downstream into the West Branch. These flows are released to enhance landlocked salmon habitat and the fishery, as well as support recreational boating on the river. During the May 15 and 16, 2024 Updated Study Report Meeting, and in a letter subsequently filed with the Commission,[2] the Maine Council of Trout Unlimited (Maine TU) asked GLHA for information on the basis for the biological flows (i.e., 1,422, 1,300, and 1,000 cubic feet per second [cfs]) released from McKay Station under the existing license. The DLA does not include this information. Rather, it describes the results of the 2022 Riverine Aquatic Habitat Study,[3] which was designed to address whether the existing flows meet Maine's water quality standards. Specifically, for the West Branch downstream from McKay Station (i.e., river reach extending 1,000 feet downstream from McKay Station), the study, which was done using drone imagery to document habitat conditions, only provides information on water depth, zone-of-passage, and wetted width at 1,000 cfs. This information, while useful for determining compliance with the state's water quality standards, does not adequately describe the biological basis for the existing McKay Station flow releases. Therefore, in order for Commission staff to analyze the environmental effects associated with existing and any proposed flow releases from McKay Station, the FLA should describe the requisite biological information that supports the existing, as well as any proposed and recommended flows. The FLA should include the information necessary for us to understand the relationship between flow and aquatic habitat in the West Branch downstream from McKay Station.

[2] *See* Maine TU's June 5, 2024 Filing.

[3] DLA at E-124 and E-125.

*Terrestrial Resources*

6. Exhibit A of the DLA for the Ripogenus Project[4] and the Penobscot Mills Project[5] includes a brief, general description of project transformers, transmission lines, and substations. Section 6.7.2.2, *Wildlife Resources*, of Exhibit E of the DLA does not include information regarding the effects of operating and maintaining the transmission facilities on terrestrial resources, including birds and other wildlife. To facilitate Commission staff's review of the design, configuration, and maintenance of the Projects' transmission facilities as they relate to avian protection, please provide the following information in the FLA:

(a) a discussion of whether the Projects' transmission line poles and other equipment currently installed are consistent with the Avian Power Line Interaction Committee (APLIC) and U.S. Fish and Wildlife Service (FWS) guidelines to minimize adverse avian interactions (i.e., potential avian electrocutions and collisions) (APLIC, 2006 and 2012;[6] and APLIC and FWS, 2005[7]);
(b) detailed descriptions, figures, and diagrams of the Projects' transmission facilities and any existing avian protection devices currently installed;
(c) the specifications and locations of any proposed avian protection measures that would be consistent with APLIC guidelines, if applicable;
(d) a copy of any Avian Protection Plan for the Projects, or a general description of any avian protection measures implemented by GLHA at the Projects; and
(e) any data regarding observed or documented avian interactions with the Projects' transmission facilities, such as nest building, perching, electrocutions, collisions, and any outages related to such interactions.

7. Exhibit E of the DLA does not include a description of GLHA's vegetation management activities within the project boundaries, beyond its forestry management practices for the wildlife management area at the Penobscot Mills Project. To facilitate Commission staff's review of the effects of the Projects' operation and maintenance

[4] DLA, Exhibit A – Section 4.0, *Transmission Line and Equipment Specifications*.

[5] DLA, Exhibit A – Sections 1.4, 2.4, 3.4, 4.4, and 5.4, *Transmission Line and Equipment Specifications*.

[6] APLIC (2006) is available at: https://www.aplic.org/uploads/files/2643/SuggestedPractices2006(LR-2).pdf; and APLIC (2012) is available at: https://www.aplic.org/uploads/files/15518/Reducing_Avian_Collisions_2012watermarkLR.pdf.

[7] APLIC and FWS (2005) is available at: https://www.aplic.org/uploads/files/2634/APPguidelines_final-draft_Aprl2005.pdf.

activities on terrestrial resources, including regular vegetation management, please provide the following information in the FLA:

(a) the types of existing and proposed vegetation management activities used at the Projects (e.g., tree trimming and removal, mowing, and herbicide applications);
(b) the locations where each vegetation management technique occurs within the project boundaries (e.g., transmission facilities; access roads; parking areas; and recreation areas);
(c) the procedures, including any time of year restrictions, for managing vegetation in sensitive habitats such as wetlands, riparian areas, and suitable locations for rare, threatened, or endangered species; and
(d) a schedule for conducting regular vegetation management (i.e., activities performed annually, seasonally, as-needed, etc.). If herbicides are used to control vegetation, please include the method/location of application (e.g., foliar, stump, stem, and/or vine).

*Threatened and Endangered Species*

8. Section 6.9., *Rare, Threatened, and Endangered Species*, of Exhibit E of the DLA discusses species protected under the Endangered Species Act, including the endangered northern long-eared bat (NLEB) and Atlantic salmon; the threatened Canada lynx; and the monarch butterfly, a candidate for federal listing, among the species that may occur within the project boundary. However, the DLA does not include the tricolored bat, which FWS proposed for listing as endangered on September 14, 2022.[8] Moreover, the DLA does not provide enough detail for Commission staff to assess potential project-related effects on federally listed, proposed, and candidate species. Therefore, in the FLA, please ensure that the *Rare, Threatened, and Endangered Species* section:

a. provides detailed, species-specific discussions of the potential project-related effects (i.e., operation; maintenance, including seasonal vegetation management and use of pesticides; and project-related recreation activities) on federally listed, proposed, and candidate species, and their habitats, that may occur at the Projects, or otherwise be affected by the Projects' operations. These species include the Atlantic salmon, NLEB, tricolored bat, Canada lynx, and monarch butterfly;
b. describes any existing or proposed tree removal activities, which includes cutting down, harvesting, destroying, trimming, or manipulating of trees, saplings, snags, or any other form of woody vegetation likely to be used by NLEBs or tricolored

[8] 87 Fed. Reg. 56,381-56,393 (September 14, 2022). Please note that the range of tricolored bats includes all of Maine, and there may be a delay for this species to appear on species lists generated on FWS's Information for Planning and Consultation (IPaC) system.

bats within the project boundaries. (Please note that suitable NLEB roosts include live or dead trees that are typically greater than, or equal to, 3 inches in diameter at breast height and have cavities, peeling bark, crevices, or hollows. Tricolored bats primarily roost among live and dead leaf clusters of live or recently dead deciduous hardwood trees, but they have also been observed roosting in lichens with pendant growth forms, as well as among pine and eastern red cedar needles); and

c. a description of any known hibernacula or maternity roost trees within or adjacent to the project boundaries.

*Cultural Resources*

9. Section 6.12.3, *Cultural Resources – Proposed Environmental Measures*, of Exhibit E of the DLA states that GLHA proposes to develop an updated Historic Properties Management Plan (HPMP) for the Projects. Please include the draft HPMP with the FLA.

**Exhibit G – Project Boundary Maps**

10. The Exhibit G maps, included with the DLA, show the existing project boundary, but do not depict the proposed project boundary. The FLA should include Exhibit G maps that show the existing project boundary for the Projects, as well as a proposed project boundary for the Projects, if changes to the project boundary(ies) are proposed. In addition, please submit with the FLA, the relevant GIS data layers for the existing and/or proposed project boundaries, as applicable.

Filed via "eFiling"

July 31, 2024

Ms. Debbie-Anne Reese, Acting Secretary
Federal Energy Regulatory Division
888 First Street, N.E.
Washington, D.C. 20426

**RE: Comment on Draft License Application, Ripogenus Project (FERC No. 2572) and Penobscot Mills Project (FERC No. 2458)**

Dear Acting Secretary Reese,

These comments are in response to the Draft License Application (DLA) submitted to FERC on May 3, 2024, by Great Lake Hydro America, LLC (GLHA, or licensee). The Bureau has been an active participant in the combined Integrated Relicensing Process (ILP) for these Projects, providing input to the development of the study plans for the Recreation and Aesthetics Studies. We attended the in-person ISR meeting in Millinocket on May 4, 2023, when the Recreation and Aesthetics Studies were discussed, participated in subsequent field visits and focus groups associated with those studies, and reviewed the Year 2 study results presented in the Updated Study Report submitted to FERC by the licensee on April 22, 2024.

As mentioned in the Recreation and Aesthetics Study Reports, provided in Exhibit E of the DLA, no recreation or aesthetics protection, mitigation, or enhancement (PM&E) measures are proposed in the DLA, in part due to ongoing study work (e.g., Year 2 Whitewater Study on the West Branch downstream of Stone Dam). Thus, based on the participation outline above, we offer the following comments on the DLA in anticipation of the forthcoming Final License Application and the PM&E measures we recommend that it include.

Recommendations for Recreation and Aesthetic Measures at the Ripogenus Project

***Ripogenus Impoundment Water Levels*** - As demonstrated by the Recreation and the Aesthetics Study data, maximized impoundment levels will help reduce the adverse effects of operations on boat launching and navigation, access to shoreline campsites, and aesthetics, which have been severe at certain times. Numerous survey respondents reported dissatisfaction with low water levels and difficulties when launching during periods of low water.

Certain scenarios included in the Operations Model Run Results submitted to FERC on June 28, 2024, appear to have beneficial effects on summer and fall Chesuncook Lake water levels. However, it is also clear that operations between the two Projects are complex and all scenarios involve tradeoffs, such as reduced flows below Ripogenus Dam and a lower North Twin impoundment pool at certain times. Therefore, at this point the Bureau does not request specific maximum and minimum Chesuncook Lake pool elevations or annual drawdown schedule, with the expectation that input from other agencies and stakeholders and the results of the ongoing Operations Model Study will inform potential future operations criteria under the new license.

However, the Bureau strongly advocates that the FLA include environmental measures that maximize Chesuncook Lake water levels during the summer and fall seasons (May-Oct), to the extent feasible considering the final results of the Operations Model Study and the existing and potential new downstream flow requirements that are anticipated to be included in the new license. The Bureau also advocates that Chesuncook Lake be refilled to the full pool target elevation each spring, if feasible, given available water and downstream flow requirements.

***Chesuncook Dam Point Boat Launch*** – The Recreation Study results indicate that this boat launch, the primary public boat access on Chesuncook Lake, was not usable about 30% of summer and fall days (May-Nov) during the 13-year period of analysis. Operations data provided by the licensee indicates that the facility may be unusable for most of the summer and fall seasons of years when drawdown is most severe. Therefore, the Bureau requests that the FLA include measures to ensure this facility is functional at all impoundment levels that are likely to occur in the May-Oct period, including during dry years. As recommended by participants in the Recreation Study, this may include the removal of large boulders and improvement of the substrate within the launching zone in use during times of substantial drawdown.

***Provision of Real-Time Ripogenus Impoundment Level Data*** – Given the substantial effects of drawdown on Chesuncook Lake boat launching facilities, navigation, and access to shoreline campsites, the availability of real-time or recent impoundment level data is of great benefit to recreation visitors. Therefore, the Bureau requests that the FLA include a measure to provide this data to the public online (e.g., GLHA's SafeWaters website, or similar).

***Maintenance of the Upper Gorge Trail*** – The Upper Gorge Trail is a FERC-approved facility but use appears to be discouraged by a lack of maintenance and obstruction of views of the gorge by vegetation growth. The Bureau requests that the FLA include a measure that ensures the trail will be regularly maintained (e.g., overgrowth controlled, blowdowns removed) and views into the gorge maintained at select locations by trimming trees and other vegetation as needed.

<u>Recommendations for Recreation Measures at the Penobscot Mills Project</u>

***Expansion of Parking at the Ambajejus Boat Launch*** – The Recreation Study documented the lack of adequate parking at this facility, exacerbated by the recent loss of informal parking nearby on licensee-owned property after that area was blocked off. The Bureau requests that FLA include a measure to explore means to provide additional parking in the vicinity.

***Increased Flows on West Branch Below Stone Dam –*** The Angler Flow Evaluation Study conducted on the West Branch in 2023 indicated the potential for improved angling

opportunities on the stream with increased flows, in the range that the Instream Flow and Habitat Assessment of West Branch Downstream of Stone Dam Study indicated will support an enhanced fishery. The pending Year 2 Whitewater Study will address the feasibility and potential quality of boating opportunities in the reach, among other goals. The Operations Modeling Study also includes two scenarios focused on increased flows below Stone Dam. The Bureau requests that the FLA, based on the results of these studies, include a schedule for increased flows below Stone Dam to benefit fisheries, angling and, potentially, whitewater recreation.

***Improved Road Access and Parking along the West Branch Downstream of Stone Dam*** – The Bureau's observations during the field component of the Angler Flow Evaluation Study indicated the roads to the river within the GLHA-owned Wildlife Management Area are in generally good condition, but that portions of the road system along the river are less usable and vehicle crossings of tributary streams are absent. In concurrence with results of the Angler Flow Evaluation Study and the Year 2 Whitewater Study, the Bureau requests that the FLA include measures to ensure existing roads are maintained in a condition suitable for anglers and boaters to access the river and that roads and bridges along the river be improved as needed to provide access, along with designation and improvement of parking areas.

<u>Recommendation to Address Recreation Facility Maintenance and Enhancement Needs at Project Sites in the Recreation Management Plan</u>

The Recreation Study documented certain maintenance needs at Project recreation facilities and users' desires for aesthetic and functional enhancements. In the DLA, GLHA proposes developing a Recreation Management Plan (RMP) and including a draft in the FLA. The Bureau recommends that the draft RMP include specific plans and details for near-term and longer-term Project recreation facility maintenance and enhancements. Examples of potential actions based on needs documented in the Year 1 and Year 2 Recreation Study Reports include repair of erosion and ice damage at the Caribou Lake boat launch, repair of the Ambajejus boat launch, and repair of the access road to Deadman's Curve boat launch. The Recreation Study data also indicate that expanded or reconfigured parking at several boat access sites at both Projects may be needed.

Thank you for the opportunity to submit these comments. Please contact me at (207) 287-2163 or via email at Jim.Vogel@maine.gov if you have any questions.

Sincerely,

James Vogel

James Vogel, FERC Coordinator
Bureau of Parks and Lands

Cc: Andrew Cutko, Rex Turner, Tammy Bishop – Bureau of Parks and Lands
Laura Paye -– Department of Environmental Protection

Brookfield
Renewable U.S.

August 1, 2024

***Via eFiling***

Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject:** **Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)**
**Sixth Study Progress Report**

Dear Acting Secretary Reese:

Great Lakes Hydro America, LLC (GLHA), Licensee of the Ripogenus Hydroelectric Project (FERC No. 2572) and the Penobscot Mills Hydroelectric Project (FERC No. 2458) (collectively referred to as the "Projects"), herein files with the Federal Energy Regulatory Commission ("FERC" or "Commission") the Sixth Study Progress Report for the relicensing of the Projects. The Projects are located on the West Branch of the Penobscot River and Millinocket Stream in Piscataquis and Penobscot counties, Maine.

The current licenses for the Projects were issued on October 22, 1996 and expire on September 30, 2026. On June 11, 2021, GLHA filed the Notices of Intent and Pre-Application Document, which initiated the formal relicensing proceeding to obtain two separate new licenses for the continued operation of the Projects through the Commission's Integrated Licensing Process (ILP). On March 23, 2022, GLHA filed a Revised Study Plan (RSP) for the Projects, and the Commission issued the Study Plan Determination (SPD) on May 13, 2022. GLHA performed study activities in 2022 with available results provided in the Initial Study Report (ISR) filed with FERC on April 24, 2023. Subsequent to the filing of the ISR, stakeholders filed comments on the ISR and new study requests, and on September 19, 2023, FERC issued the second SPD. GLHA performed continued study activities in 2023 for which available results were provided in the Updated Study Report (USR) filed with FERC by April 22, 2024. Additional studies are ongoing in 2024.

GLHA herein submits the Sixth Study Progress Report for the period from May 1, 2024 through July 31, 2024 for the Projects. The enclosed table (report) provides a list of the required studies and associated status of progress, as well as any modifications to the approved methodologies.

Concurrent with this filing, GLHA is providing a copy of this letter to all parties listed in the attached distribution list. A copy of the Sixth Study Progress Report can be downloaded from FERC's eLibrary system at https://www.ferc.gov/docs-filing/elibrary.asp by conducting a search using the docket numbers p-2458 and/or p-2572.

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

If you have any questions regarding this information, please contact me at Michael.Scarzello@brookfieldrenewable.com.

Sincerely,



Michael Scarzello
Manager, Licensing
Brookfield Renewable U.S.

cc: Relicensing Distribution List

Enclosure: Sixth Study Progress Report

**GREAT LAKES HYDRO AMERICA, LLC**
1024 Central Street, Millinocket, ME 04462
T +1 207.723.4341 F +1 207.723.4597 brookfieldrenewableUS.com

Ripogenus Hydroelectric Project (FERC No. 2572)
Penobscot Mills Hydroelectric Project (FERC No. 2458)
Pre-Application Document
Distribution List

**Federal Agencies**

Rachael Mangum, MA, RPA
Assistant Director
Federal Permitting, Licensing, and Assistance Section
Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001

Glori James-Suarez
Realty Specialist
Northeastern States
Bureau of Land Management
250 E. Wisconsin Avenue, STE 1100
Milwaukee, WI 53202

Jarrett Devine
Deputy Administrator
Region 1
Federal Emergency Management Agency
PO Box 10055
Hyattsville, MD 20782-8055

Lori A. Ehrlich
Region 1 Administrator
Region 1
Federal Emergency Management Agency
PO Box 10055
Hyattsville, MD 20782-8055

Debbie-Anne A. Reese
Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

John Spain
Regional Engineer
Division of Dam Safety and Inspections
New York Regional Office
Federal Energy Regulatory Commission
19 West 34th Street, Suite 400
New York, NY 10001-3006

Christopher Boelke
Chief, New England Branch
Habitat and Ecosystem Division
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Donald Dow
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Jon Hare
Director, Northeast Region
Northeast Fisheries Science Center
National Oceanic and Atmospheric Administration
166 Water Street
Woods Hole, MA 02543-1026

Dan Kircheis
Penobscot Bay Salmon Recovery Coordinator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Jeff Murphy
Maine Field Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
17 Godfrey Drive, Suite 1
Orono, ME 04473

Michael Pentony
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
55 Great Republic Drive
Gloucester, MA 01930

Kevin Mendik
Hydro Program Manager
Northeast Region
National Park Service
15 State Street
Boston, MA 02109

Jana Jacobson
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Richard Kristoff
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Maine Project Office
U.S. Army Corps of Engineers
442 Civic Center Drive, Suite 350
Augusta, ME 04330

Marchelle Foster
Hydroelectric Power Program Manager
U.S. Bureau of Indian Affairs
NW Regional Office
911 NE 11th Avenue
Portland, OR 97232-4169

Darryl Lacounte
Director
U.S. Bureau of Indian Affairs
MS 4606 MIB
1849 C Street NW
Washington, DC, 20240

Harold Peterson
Natural Resources Officer
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

Leonard Rawlings
FERC Coordinator
Eastern Region
U.S. Bureau of Indian Affairs
545 Marriott Drive, Suite 700
Nashville, TN 37214

David Bernhardt
Secretary
U.S. Department of Interior
1849 C Street, NW
Washington, DC 20240

Andrew Raddant
Regional Environmental Officer
Office of Environmental Policy & Compliance
U.S. Department of Interior
15 State Street, Suite 400
Boston, MA 02109

Office of the Solicitor, Northeast Region
U.S. Department of Interior
15 State Street, 8th Floor
Boston, MA 02109-3502

Joseph Bishop
Water Division Hydro Coordinator
New England Region
U.S. Environmental Protection Agency
5 Post Office Square
Boston, MA 02109

Karen McGuire
New England Region 1
Deputy Regional Administrator
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Timothy Timmermann
New England Region 1
NEPA Director
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Kyle Olcott
Hydropower Coordinator
Maine Field Office
U.S. Fish and Wildlife Service
306 Hatchery Road
East Orland, ME 04431

Bryan Sojkowski
Civil Engineer
Northeast Region
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587

Nick Stasulis
Data Section Chief
U.S. Geological Survey
196 Whitten Road
Augusta, ME 04333

**State Agencies**

Ryan Gordon
State Geologist, MGS Director
Maine Geological Survey
Maine Department of Agriculture, Conservation, and Forestry
93 State House Station
17 Elkins Lane
Augusta, ME 04333-0022

Lisa St. Hilaire
Information Manager
Maine Natural Areas Program
Maine Department of Agriculture, Conservation, and Forestry
177 State House Station
Augusta, ME 04333

James Vogel
Senior Planner
Bureau of Parks and Lands
Maine Department of Agriculture, Conservation, and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333-0022

Heather Johnson
Commissioner
Maine Department of Economic Community Development
59 State House Station
Augusta, ME 04333-0059

Laura Paye
Hydropower Coordinator
Bureau of Land and Water Quality
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Mark Caron
Regional Wildlife Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Kevin Dunham
Regional Fisheries Biologist
Region F Penobscot Region
Maine Department of Inland Fisheries and Wildlife
16 Cobb Road
Enfield, ME 04493

Douglas Kane
Regional Wildlife Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

Tim Obrey
Regional Fisheries Biologist
Region E Moosehead Region
Maine Department of Inland Fisheries and Wildlife
PO Box 551
Greenville, ME 04441

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
41 State House Station
Augusta, ME 04333-0041

Casey Clark
Resource Coordinator
Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

Sean Ledwin
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Erin Wilson
Coastal Policy Specialist
Maine Coastal Program
Maine Department of Marine Resources
21 State House Station
Augusta, ME 04333-0021

Kirk Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Megan Rideout
Review & Compliance / CLG Coordinator
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Dr. Arthur Spiess
Chief Historic Preservationist, Prehistoric Archaeology
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333

Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

**Municipalities and Government Officials**

Janet Mills
Governor of Maine
Office of the Governor
1 State House Station
Augusta, ME 04333-0001

Board of County Commissioners
Penobscot County
97 Hammond Street
Bangor, ME 04401-4913

Amy Polyot
District Manager
Penobscot County Soil & Water Conservation District
1423 Broadway, Suite 2
Bangor, ME 04401

Board of County Commissioners
Piscataquis County
163 E. Main Street
Dover-Foxcroft, ME 04426

Sarah Robinson
Executive Director
Piscataquis County Soil & Water Conservation District
USDA Service Center
42 Engdahl Drive
Dover-Foxcroft, ME 04426

Michael Michaud
Chairman
Town of East Millinocket
53 Main Street
East Millinocket, ME 04430

Peter Jamieson
Town Manager
Town of Millinocket
197 Penobscot Avenue
Millinocket, ME 04462

Jared Golden
U.S. Representative
U.S. House of Representatives
6 State Street, Suite 101
Bangor, ME 04401

Susan Collins
U.S. Senator
U.S. Senate
68 Sewall Street, Room 507
Augusta, ME 04330

Angus King
U.S. Senator
U.S. Senate
40 Western Avenue
E.S. Muskie Federal Building, Room 412
Augusta, ME 04330

Stacey Guerin
State Senator
3 State House Station
Augusta, ME 04333

Kathy Irene Javner
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, Maine 04333

Trey Stewart
State Senator
3 State House Station
Augusta, ME 04333

James Lee White
State Representative
House Minority Office
Room 332, State House
2 State House Station
Augusta, ME 04333-0002

**Native American Tribes**

Edward Peter Paul
Chief
Aroostook Band of Micmacs
Educational Center
7 Northern Road
Presque Isle, ME 04769

Clarissa Sabattis
Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Isaac St. John
Tribal Historic Preservation Officer
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

Rena Newell
Chief
Passamaquoddy Tribe
Pleasant Point
PO Box 343
Perry, ME 04667

William Nicholas
Chief
Passamaquoddy Tribe
Indian Township
PO Box 301
Princeton, ME 04668

Donald Soctomah
Tribal Historic Preservation Officer
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

Kirk Francis
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chuck Loring
Director
Natural Resources Department
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Dan McCaw
Fisheries Biologist
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

Chris Sockalexis
Tribal Historic Preservation Officer
Cultural and Historic Preservation Program
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

**Additional Parties**

Dr. Andrew Fisk
Northeast Regional Director
American Rivers

Kevin Richard Colburn
National Stewardship Director
American Whitewater
1035 Van Buren Street
Missoula, MT 59802

Robert Nasdor
Northeast Stewardship & Legal Director
American Whitewater
65 Blueberry Hill Lane
Sudbury, MA 01776

Mark Zakutansky
Director of Conservation Policy Engagement
Appalachian Mountain Club
45 Jordan Road
Albrightsville, PA 18210-0527

John R. J. Burrows
Director of New England Programs
Atlantic Salmon Federation
Fort Andross, Suite 202
14 Main Street
Brunswick, ME 04011

Sarah Sindo
Site Manager
Big Eddy Campground

Jeff Russell
Bloomer Russell Beaupain
175 Exchange Street, Suite 200
Bangor, ME 04401

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Owners Association and Chesuncook Dam Camp Owners Association
PO Box 145
Kingfield, ME 04947

Stephen Perry
Representative
Carpenters Health and Safety Fund

Sean Mahoney
Conservation Law Foundation
53 Exchange Street
Portland, ME 04101

Lee Umphrey
CEO & President
Eastern Maine Development Corporation
40 Harlow Street
Bangor, ME 04401

P. Andrew Hamilton
Shareholder & Chair
Eaton Peabody, PA.
80 Exchange Street
Bangor, ME 04401

Brian Olas
Sales Executive
Exterus
82 Hanover Street, Suite 4
Portland, ME 04101

Bryant Davis
President
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Vernon Haines
Fin and Feather Club of Maine
PO Box 123
Millinocket, ME 04462-0123

Marvin Waldrep
Senior Counsel
Georgia-Pacific, Inc.
PO Box 105605
Atlanta, GA 30348-5605

John O'Leary
Great Bay Hydroelectric Associates
76 Thatcher Street
Westwood, MA 02090-2527

Kevin Bernier
Senior Compliance Specialist
Great Lakes Hydro America LLC
1024 Central Street
Millinocket, ME 04462

Jesika Lucarelli
Great Mountain Guide Service

Mark Nadeau
International Association of Machinists
245 Pamola Park
Millinocket, ME 04462

Rick LeVasseur
Katahdin Region Tourism Council
46 Marina Drive
South Twin Lake
Millinocket, ME 04462

Andrew Beahm
Executive Director
Maine Audubon Society
20 Gilsland Farm Road
Falmouth, ME 04105-2100

Patrick McTeague
McTeague, Higbee, Case, Cohen, Whitney & Toker, P.A
Maine Building Trades Council
PO Box 5000
Topsham, ME 04086-5000

Erich Veyhl
Analyst
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Robert Voight
Maine Conservation Rights Institute
24 Orchard Road
Concord, MA 01742-3202

Steven Tuckerman
Maine Flow
67 Litchfield Avenue
Rutland, VT 05701-3511

Richard Hill
Maine Professional Guides Association
55 Morrison Hill Road
Wilton, ME 04294-4040

Arthur Dickey
Maine Rafting Expeditions

Landis Hudson
Executive Director
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Chuck Verrill
President
Maine Rivers
PO Box 782
Yarmouth, ME 04096

Mary Haley
CEO
MXH Marketing

Matt Polstein
New England Outdoor Center

Jim Murton
North Country Rivers

Jeremy Hargreaves
Northeast Whitewater

Derek Heady
Northeast Whitewater

Suzie Hockmeyer
Co-founder
Northern Outdoors, Inc.
1771 US Rt 201
The Forks, ME 04985

Emily Yearwood
Northern Outdoors, Inc.
1771 US Rt 201
The Forks, ME 04985

Michael Smith
Outdoor Sport Institute
176 Highland Ave
Millinocket, ME 04462

Kenny DeCoster
Vice President
Penobscot Paddle and Chowder Society

Peter Pray
President
Pray's Big Eddy Campground, Inc.
PO Box 548
Millinocket, ME 04462-0548

Amanda Williams
Representative for Allagash Gateway Campground
Rudman Winchell
84 Harlow Street, PO Box 1401
Bangor, ME 04402

Matthew Streeter
Sebago TU Chapter
66 Quebec Street, Apt 2
Portland, ME 04101

Tom Tyler
President
Sportsman's Alliance of Maine
205 Church Hill Road
Augusta, ME 04330

Jimmy Doria
Three Rivers Whitewater

Neil Hagstrom
Trout Unlimited

Stephen Heinz
FERC Coordinator
Trout Unlimited
3 Spruce Lane
Cumberland Foreside, ME 04110

Fred Miller
President
United Plant Guard Workers of America
119 Wheaton Road
Dover Foxcroft, ME 04426

Sharon Klein
Associate Professor, School of Economics
University of Maine, Orono,

Dean Beaupain

Jeff Fayle

Curt & Emelie Ferland
81 Oak Grove Road
Vassalboro, ME 04989

George Forgette

Peter Forti

Owen Genest
13 Maplewood Drive
Sandford, ME 04073

N. Stuart Harris

Kathleen Houston
PO Box 145
Kingfield, ME 04947

Christopher Howe

Michael Hudson
618 S Clary Road
Jefferson, ME 04348

Philip Hulbert
895 Brickhouse Hill Rd
East Meredith, NY 13757

Tom Janelle
41 Hadlock Road
Falmouth, ME 04105

Paul Johnson
35 Hammond Drive, PO Box 512
Oakland, ME 04963

John Kirk
1062 Ocean Avenue
Portland, ME 04103

James Lepage
101 Bradley Drive
Bennigton, VT 05201

Jim Murton

Charles Paone

Richard Parkes

Edward Spear
307 Mt. Hope Avenue
Bangor, ME 04401

Robert Vadas
2909 Boulevard Road SE
Olympia, WA 98501-3971

Robert Van Deventer

Wes Zemrak
2 Brookside Drive
Falmouth, ME 04105

SIXTH STUDY PROGRESS REPORT

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>Sixth Study Progress Report<br>(May 1, 2024 through July 31, 2024) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 1a | Water Quality Study – Impoundment Lake Trophic Assessment | Study completed as required in 2022 with study results provided in the ISR. | None. |
| 1b | Water Quality Study – Downstream DO/Water Temperature Assessment | • First season study activities were completed as required in 2022 with study results provided in the ISR.<br>• Based on comments during the ISR Meeting and pursuant to FERC's SPD issued September 19, 2023, additional water temperature data was collected at three monitoring sites in the West Branch downstream of Stone Dam in June and July 2023 with results provided in the USR. | None. |
| 1c | Water Quality – Benthic Macroinvertebrate Assessment | • First season study activities were completed as required in 2022 with study results provided in the ISR.<br>• Additional macroinvertebrate data was collected in 2023 at two locations in the West Branch downstream of Stone Dam with results provided in the USR. | None. |
| 1d | Water Quality – Impoundment Aquatic Habitat Assessment | Study completed as required in 2022 with study results provided in the ISR. | None. |
| 1e | Water Quality – Riverine Aquatic Habitat Assessment | Study completed as required in 2022 with study results provided in the ISR. | None. |
| 2 | Instream Flow and Habitat Assessment of West Branch below Stone Dam | Study completed as required in 2022 with study results provided in the ISR. | None. |

| No. | Study | Status | Modifications to Methodology |
|---|---|---|---|
| 3 | Fish Assemblage Survey Study | • First season study activities completed in 2022 with study results provided in the ISR.<br>• Pursuant to FERC's SPD issued September 19, 2023, GLHA performed a fish assemblage survey at the Ripogenus Project in the spring of 2024.<br>• Data collected during the spring of 2024 will be provided in a USR supplement or the Final License Application. | None. |
| 4 | Fish Stranding Study | • Study completed as required in 2022 with study results provided in the ISR.<br>• Additional information specific to the Fish Stranding Mitigation Study and the McKay Station Ramping Study is provided below. | None. |
| 5 | North Twin Impoundment Tributary Access Survey | • Study completed as required in 2022-2023 with study results provided in the ISR and USR. | None. |
| 6 | Upstream American Eel Passage Assessment Study | • Study completed as required in 2022-2023 with study results provided in the ISR and USR. | • Heavy precipitation coupled with planned unit outages for maintenance during the summer of 2023 resulted in high flows in the rivers and spill conditions at the dams limiting the ability to perform nighttime eel observations and electrofishing surveys. Although there were fewer surveys than anticipated, the monitoring completed in 2023 allowed GLHA to gain a good understanding of juvenile American eel presence and behavior at the Penobscot Mills Project. |

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>Sixth Study Progress Report<br>(May 1, 2024 through July 31, 2024) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 7 | Desktop Downstream Eel Passage Route and Survival Study | • Study completed as required in 2022 with study results provided in the ISR. | None. |
| 8 | Recreation Study | • Study completed as required in 2022-2024 with study results provided in the ISR and USR.<br>• Recreation user survey data was filed with FERC on June 28, 2024. | None. |
| 9 | Whitewater Boating Assessment Study | • First season study activities were completed in 2022 with study results provided in the ISR.<br>• Per the September 19, 2023 SPD, GLHA is in the process of planning, in consultation with AW, AMC, and boating interests a Level 2 evaluation of the West Branch below Stone Dam.<br>• Data collected in 2024 will be provided in a USR supplement or the FLA. | None. |
| 10 | Aesthetic Study | • Study was completed as required with study results provided in the ISR and USR. | None. |
| 11 | Historic Architectural Survey | • Study completed as required in 2022 with study results provided in the ISR.<br>• GLHA is in the process of reviewing and addressing comments provided by the Maine Historic Preservation Commission and will provide updated information, as appropriate, in a USR supplement or the FLA. | None. |
| 12 | Historical Operations Data Assessment Study | • Study completed as required in 2022 with study results provided in the ISR. | None. |

| Ripogenus Hydroelectric Project (FERC No. 2572)<br>Penobscot Mills Hydroelectric Project (FERC No. 2458)<br>Sixth Study Progress Report<br>(May 1, 2024 through July 31, 2024) | | | |
|---|---|---|---|
| **No.** | **Study** | **Status** | **Modifications to Methodology** |
| 13 | Operations Model Study | • First season study activities were completed in 2022 with study results provided in the ISR.<br>• GLHA hosted a 2-day, Operations Model Technical Workshop for stakeholders to participate in-person or virtually on January 31-February 1, 2024.<br>• GLHA evaluated stakeholder requested alternative operating scenarios using the Operations Model with results filed with FERC on June 28, 2024 as a USR supplement.<br>• GLHA hosted a virtual meeting for stakeholders on July 10, 2024 to explain the operations model run results with information from that meeting filed with FERC on July 22, 2024. | None. |
| 14 | Wood Turtle Habitat and Presence Evaluation Study | • Study completed as required in 2022-2023 with study results provided in the USR. | None. |
| 15 | Marsh Bird Survey Study | • Study completed as required in 2022-2023 with study results provided in the USR. | None. |
| 16 | Furbearer Survey Study | • Study completed as required in 2023 with study results provided in the USR. | None. |
| 17 | Common Loon Management Plan Assessment Study | • Study was completed as required in 2022 with study results provided in the ISR. | None. |
| 18 | Riparian and Littoral Habitat Assessment Study | • Study completed as required in 2022-2023 with study results provided in the ISR and USR. | None. |
| 19 | Terrestrial, Botanical and Wildlife Resources Study | • Study completed as required in 2022-2023 with study results provided in the ISR and USR. | None. |
| 20 | Environmental Justice Study | • Study completed as required in 2022-2023 with study results provided in the ISR and USR. | None. |

| No. | Study | Status | Modifications to Methodology |
|---|---|---|---|
| 21 | USGS Gage Feasibility Study | • Study completed as required in 2023-2024 with study results provided in the USR. | None. |
| 22 | McKay Station Ramping Study | • In early September 2023, GLHA consulted with MDIFW to identify the window of time in which the study could be performed in consideration of the fish spawning season. MDIFW indicated the study should be performed after September 30 but prior to October 15, 2023. Due to the high precipitation events, in combination with the scheduled maintenance activities at McKay Station, which resulted in one or more turbine units were unavailable from early September through October 2023, GLHA was not able to perform the field activities during the designated time period.<br>• In early 2024, GLHA consulted with MDIFW and TU on the schedule and methods for the study field activities.<br>• Per consultation, the Ramping Study field activities were completed on July 17 and 24, 2024.<br>• The Ramping Study results will be included in a report that will be provided in a USR supplement or the FLA. | None. |
| 23 | Fish Stranding Mitigation Evaluation Study | • GLHA will complete the required Fish Stranding Mitigation Evaluation Study subsequent to the completion of the McKay Station Ramping Study and will file the results with FERC when available. | None. |
| 24 | Umbazooksus Lake Mitigation Evaluation Study | • Study completed as required in 2023-2024 with study results to be provided in a USR supplement or the FLA. | None. |
| 25 | Angler Flow Evaluation in West Branch below Stone Dam | • Study completed as required in 2023 with study results provided in the USR. | None. |

JANET T. MILLS
GOVERNOR

STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
353 WATER STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041

JUDITH CAMUSO
COMMISSIONER

***Via Electronic Filing***

August 1, 2024

Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

**Re: MDIFW Comments on the Draft License Application for the Ripogenus Hydroelectric Project (FERC No. 2572) and Penobscot Mills Hydroelectric Project (FERC No. 2458)**

Dear Acting Secretary Reese:

The Maine Department of Inland Fisheries and Wildlife (MDIFW) has reviewed Great Lakes Hydro America, LLC's (GLHA, Licensee) Draft License Application (DLA) for the Ripogenus and Penobscot Mills Projects filed April 22, 2024.

## Ripogenus Project

According to Section 5.1 Existing Environmental Measures of the DLA, GLHA proposes to operate the Ripogenus Project with several environmental PM&E measures. MDIFW offers comments and recommendations on several of these measures below.

### Fisheries Recommendations

*Impoundment Elevations*

MDIFW has received the results of the Operations Model Run exercise and we are currently reviewing it. We anticipate further discussions with the Licensee and other stakeholders regarding water management between the two Projects. Therefore, final comments and recommendations will be made at a later date. MDIFW had requested the modeling exercise to include a model run to evaluate downstream flows while maintaining the lake elevations that allow recreational access to the Ripogenus impoundment. That said, MDIFW is supportive of the concept of reducing drawdowns in the Ripogenus impoundment during the summer recreational season. This would also be less impactful to the waterbird breeding season and overall aquatic benthic and associated wetland communities, to the extent feasible considering the final results of the Operations Model Study, including any existing and potential new downstream flow requirements that are anticipated to be included in the new licenses.

We understand a revised Water Management Plan will require changes to downstream flows and result in impacts to other impoundments in the system. We will reserve final recommendations until after the model analysis is complete.

PHONE: (207) 287-5254 FISH AND WILDLIFE ON THE WEB: www.maine.gov/ifw EMAIL ADDRESS: MDIFWEnvironmentalreview@maine.gov

*Attraction Flow to the Gorge*

As a condition of their current FERC license, the Licensee is required to provide a flow of 100 cfs through Ripogenus Dam to provide a summer attraction flow into the Gorge to create angling opportunities. It was assumed that this flow would be provided through the dam's deep gates and therefore would be cool water from below the thermocline. Due to mechanical limitations, flow has been provided from a surface gate. This negates the intent to provide a cool attraction flow for landlocked salmon and consequently does not provide additional angling opportunities sought as mitigation in the current license. MDIFW requests that the Final License Application (FLA) specify that the 100 cfs attraction flow originate from a deep gate, or from water below the thermocline, for the pending license.

*Ramping Flows*

To minimize impacts resulting from rapidly changing water levels on fish and aquatic macroinvertebrates, including multiple modeled and/or predicted Species of Greatest Conservation Need, as described in Maine's 2015 State Wildlife Action Plan, MDIFW recommends changes in hourly rates of flow in the West Branch of the Penobscot River downstream of the Ripogenus Project to be limited to no more than 25%. MDIFW believes this should help to reduce stranding and minimize impacts on the aquatic community.

*Smelt Drift*

Smelt are critical forage for landlocked salmon growth. The resident population of salmon in the West Branch of the Penobscot River below Ripogenus Dam rely on year-round smelt drift from the Ripogenus Impoundment through both Ripogenus Dam and McKay Station to sustain their growth, and past studies have documented the annual drift to be substantial. MDIFW requests no changes to trash racks or other modifications that may reduce smelt drift that could negatively impact one of Maine's premier landlocked salmon fisheries.

*Holbrook Side Channel*

MDIFW recommends that flows into the Holbrook Side Channel continue to be managed for enhanced salmonid spawning and nursery habitat, as per the current license.

*USGS Gage*

MDIFW requests the Licensee fund the installation and maintenance of a USGS gage on the West Branch of the Penobscot River below McKay Station, at a suitable location as determined by the USGS. There is often confusion over the flow readings for this heavily regulated system that originate from the output at McKay Station, and MDIFW believes a USGS gage would alleviate these concerns for all stakeholders, particularly during outages. We also request the Ripogenus Lake elevation be provided on the USGS gage and on the Licensee's SafeWaters website.

*Winter Access*

Access to surface waters of the State and their fishery resources is an important State and Department goal. As land ownership changes across the State, public access opportunities to water resources are challenged, while the demand for water based, outdoor activities climb. Providing winter angling is an important management strategy for MDIFW on the Ripogenus Impoundment. Winter angler harvest of salmon is critical to maintaining the forage base and good salmon growth rates. Angler access is limited in the winter to two sites: the boat launch at the old Chesuncook Dam site and a small pull-off site on Caribou Lake. The Caribou Lake access site is essentially a wide area plowed on the side of the Golden Road that can accommodate 4-5 vehicles at best. The main public access site is the boat launch area at the old Chesuncook Dam site. This area is congested on the weekends and limits angling participation on the lake. MDIFW requests the Licensee provide additional funding annually to help the camp owners association maintain wintertime access for the benefit of all wintertime users.

*Improved Angler Access*

Public access has been restricted at several locations in the Project area, including around McKay Station, among other areas. While MDIFW understands the need for Project security, efforts should be made to allow the public access to these resources. We recommend access be restored in areas where fencing has been installed by the Licensee for angling and other recreational opportunities.

*Fisheries Funding*

Much of the data used to evaluate the fisheries in the rivers and impoundments impacted by hydroelectric development originate from ongoing routine monitoring by MDIFW. These monitoring efforts are necessary to provide long-term trend analyses on fisheries and fish populations. One-time studies conducted by Licensees every 20 to 30+ years at the time of relicensing efforts may not accurately reflect long-term trends. Moreover, these brief studies are often impacted by short-term climatic and other conditions. Continual and periodic monitoring of lakes and rivers utilizing creel surveys, use and harvest estimates, and other sampling techniques are necessary to ensure a full understanding of the fish populations and any changes that could occur as a result of ongoing hydroelectric operations. Therefore, MDIFW requests the Licensee's cooperation in funding studies, to be conducted by MDIFW, in the Project area over the term of the next License.

Wildlife Recommendations

*Maintenance of the Umbazooksus Lake Mitigation Area*

The wetland mitigation activities performed at Umbazooksus Lake satisfied the wetland mitigation requirements for both the Ripogenus Project and the Penobscot Mills Project in the current license. Pursuant to the FERC-approved plan, GLHA discontinued storage and release operation in the spring of 1998 at Umbazooksus Lake by maintaining the outlet gate in a

permanently opened position, resulting in a run-of-river regime to lower water levels and enhance wetlands at Umbazooksus Lake (Umbazooksus Lake Mitigation Area, ULMA).

However, additional needed information was raised by MDIFW regarding the Riparian and Littoral Habitat Assessment Study to better understand the full potential of the ULMA to offset the whole suite of impacts, not only to wetlands. Furthermore, the Cover Type Mapping report states that the Projects' boundaries include a total of approximately 71,097 acres, the majority of which (>83%, or approximately 59,011 acres) consists of open water associated with the Projects' impoundments, with impacts to the benthic habitat and macroinvertebrate community because of seasonal drawdowns. Therefore, while the ULMA *may* continue to satisfy impoundment-associated wetland impacts (pending MDIFW's review of earlier additional data requests), they may not satisfy lacustrine impacts resulting from drawdowns at the two Projects, or riparian wetland and riverine aquatic habitat impacts along the West Branch of the Penobscot River. Moreover, the ULMA does not mitigate for impacts to the diverse wildlife groups which encompasses benthic invertebrates/macroinvertebrates, including multiple modeled and/or predicted aquatic or aquatic-associated invertebrate Species of Greatest Conservation Need (as described in Maine's 2015 State Wildlife Action Plan), fishes, amphibians, reptiles, aquatic mammals (e.g., beavers, muskrat[1]) and water-dependent birds (e.g., common loons, breeding and foraging marsh birds, and breeding and foraging waterfowl). At present, MDIFW is unable to accept solely the proposed ULMA until fully analyzing the requested study results. MDIFW requests the Licensee work with MDIFW to better minimize these impacts by exploring changes to Project operations, as indicated above. Ultimately, MDIFW believes that even with some Project operational changes, impacts to wetlands and wildlife species will continue for the new License, and that any PM&E measures to offset both wetland and wildlife impacts will likely require mitigation in addition to the ULMA. Specific to aquatic lacustrine and riverine macroinvertebrate impacts, MDIFW requests GHLA consider other holdings with intact riparian corridors as potential mitigation sites.

*Common Loon Management Plan*

As stated in our earlier comments, the common loon is identified as a Priority 2 Species of Greatest Conservation Need by MDIFW's Comprehensive Wildlife Conservation Strategy, also known as Maine's State Wildlife Action Plan (MDIFW 2015). Project operations at the Ripogenus Project have impacted the reproductive success of this species, and as a result the Licensee has implemented a Common Loon Management Plan. However, it remains unclear to MDIFW how thoroughly the current Plan has been adhered to. Attached are images[2] of abandoned loon platforms, located at Sites 5 and 7, from July 22, 2024. The water level on Chesuncook was estimated by the photographer to be approximately 6.6 feet down (el. 935 feet). Stable water levels or active loon management via rafts between May 15 through July 31 are typically prescribed to protect nesting loons and wildlife habitat; in these instances, the evidence suggests loons were not successful at these locations in 2024.

[1] While not requested to be assessed as part of Furbearer Survey Study, the timing and extent of drawdowns at North Twin (approximately 12-foot drawdown between October 1st and the spring freshet) are also expected to impact resident aquatic furbearers
[2] Photographs courtesy of Kathy Houston



To be effective at mitigating water level drawdowns on nesting, active management of loon platforms involves relocating floating nests as lake levels are drawn down for the entirety of the nesting season. Judging from the lack of water and resulting growth of vegetation, it appears these rafts were not actively managed throughout the nesting season in 2024. If this continues, an ecological trap could result (DeSorbo et al. 2007).

The Licensee proposes to file an updated Loon Nest Management Plan with the FLA. MDIFW recommends a more robust plan that, at a minimum, includes:

- For the first five years of the new license, weekly monitoring performed by qualified biologists with expertise in loon biology and management throughout the loon nesting season (e.g., May, June, and July).

- For the first five years of the new license, confirm the locations of all territories, including any newly established and/or abandoned territories, and assess the possible cause(s) of territory abandonment.
- For the first five years of the new license, monitor and document all nesting sites to determine nesting attempts, clutch sizes, hatching success, and to document any nest failures. An assessment of use at each platform compared with an assessment of natural breeding should also be included.
- For the first five years of the new license, compare nesting/hatching rates and success with those of previous years.
- Annually for the life of the new license, identify, attribute, and quantify probable causes of nest failure including water-level fluctuation or failure/stranding of nest platforms.
- Annually for the life of the new license, conduct weekly active relocation of loon platforms during seasonal drawdowns for territories prone to dewatering.
- Annually for the life of the new license, submit a report to MDIFW and USFWS, summarizing the active loon management efforts at the Ripogenus Project. In addition to the above, the annual report should include the dates of installation, dates of removal, and a description and dates of necessary maintenance repairs for each platform.

Note that MDIFW requests the Licensee work with MDIFW by exploring changes to Project operations, as indicated above, which could lessen impacts to breeding loons and possibly result in a less intensive management regime.

## Penobscot Mills Project

According to Section 5.1 Existing Environmental Measures of the DLA, GLHA proposes to operate the Penobscot Mills Project with several environmental PM&E measures. MDIFW offers comments and recommendations on several of these measures below.

### Fisheries Recommendations

*North Twin Impoundment*

The North Twin impoundment is home to some of the best salmonid fisheries in the Millinocket area. Principal coldwater fisheries include lake trout, brook trout, and landlocked salmon. A self-sustaining lake whitefish population is also present in the impoundment and has historically provided a fishery in the winter. MDIFW currently stocks brook trout each fall in the impoundment, and additionally stocks lake trout on an alternate year basis. The landlocked salmon fishery, while previously supported by hatchery stocked fish, has become exclusively dependent on natural reproduction since 2018. The 1996 FERC license included lake trout water level management (Article 408) requiring GLHA to carefully control water levels in the North Twin impoundment to protect lake trout spawning shoals. The attempt to establish a self-sustaining lake trout population in the North Twin impoundment was unsuccessful and Article 408 was amended in 2012 to loosen water level requirements.

Landlocked Salmon

MDIFW submitted an initial study request in response to the Pre-Application Document (PAD), a Comprehensive Impoundment Landlocked Salmon Habitat Use/Spawning Study, which included several goals and objectives. Among the information MDIFW had hoped to gain through tracking radio-tagged landlocked salmon included: track seasonal movements and behaviors of landlocked salmon (within and between the five connected lakes) via radio telemetry; determine the effects of annual Project drawdowns on the movement and behaviors of landlocked salmon within the North Twin impoundment; and identify landlocked salmon spawning areas within the North Twin impoundment.

The initial study request was denied, and instead the Licensee proposed and conducted the North Twin Impoundment Tributary Access Study, with the following goals and objectives: identify tributaries to the North Twin impoundment that are used by landlocked salmon for spawning or that have habitat suitable for spawning; survey the identified tributary streams and identify potential natural and Project-related fish passage barriers near their confluence with the North Twin impoundment; and evaluate the effects of the typical seasonal impoundment fluctuation on tributary access by landlocked salmon during critical life stages. Findings of the Tributary Access Study concluded that "*The lowest daily average elevation of the North Twin impoundment during the landlocked salmon spawning season over the past 11 years was 485.4 feet. Based on bathymetry data and the channel form documented in the confluence area, this elevation would be expected to provide spawning salmon with zone of passage (0.5 foot) within the channel and into Nahmakanta Stream"*.

Lake Whitefish

Throughout most of the year the lake whitefish population in the North Twin impoundment is predominantly concentrated in the north basin in proximity to cold, deep, well-oxygenated water. Occasionally anglers will encounter lake whitefish near the southern basins. Whitefish populations in Maine have significantly declined since the early 1900's and are today believed to occur in just 50 or fewer waterbodies in the State (Whitaker and Wood 2019). The Maine Wildlife Action Plan recognizes lake whitefish as a Species of Greatest Conservation Need in the State and has identified recruitment failure at early life stages as a potential cause of population declines (MDIFW 2015).

Radio telemetry data from northern Maine indicates lake whitefish spawn during early November during the time water temperatures fall to $6^{O}$C and below. Preferential spawning habit for both wind-swept shoals and tributaries consists of clean, well-layered cobble. Additionally, areas of moderately sloped shorelines with a water depth reaching four to five feet within 100 feet of land and facing prevailing northwest winds creating sufficient wave action are also favored (Whitaker and Wood). As such, water level fluctuations during spawning and egg incubation can contribute to a decline in lake whitefish recruitment.

Based on past MDIFW sampling events the lake whitefish population in the North Twin impoundment seems highly variable, though appearing at its most robust and stable levels during the 1996-2012 time period when the aforementioned lake trout water level management plan was

in effect (Figure 1.). Lake whitefish and lake trout have similar life histories and spawning habitat requirements, and indications are the lake whitefish population benefited and thrived under the original (1996) Article 408 water level requirements of stable impoundment levels with a minimum set level between October and April (Figure 2.).

**Figure 1.**

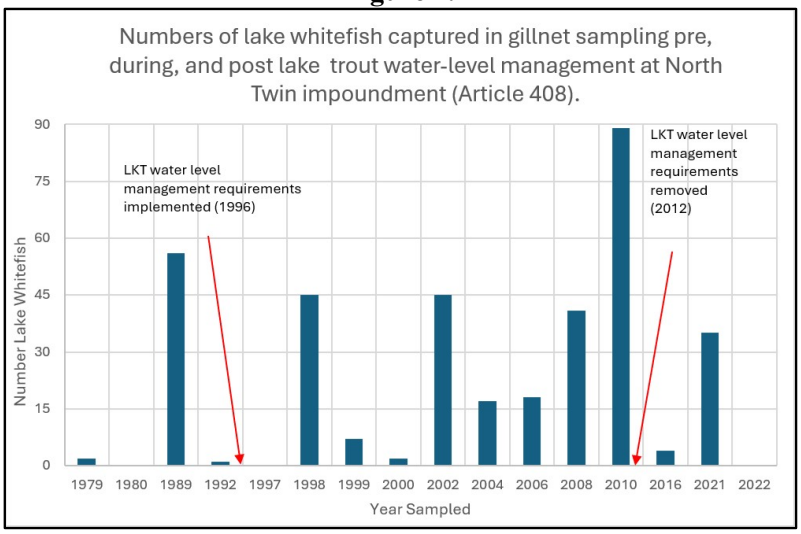
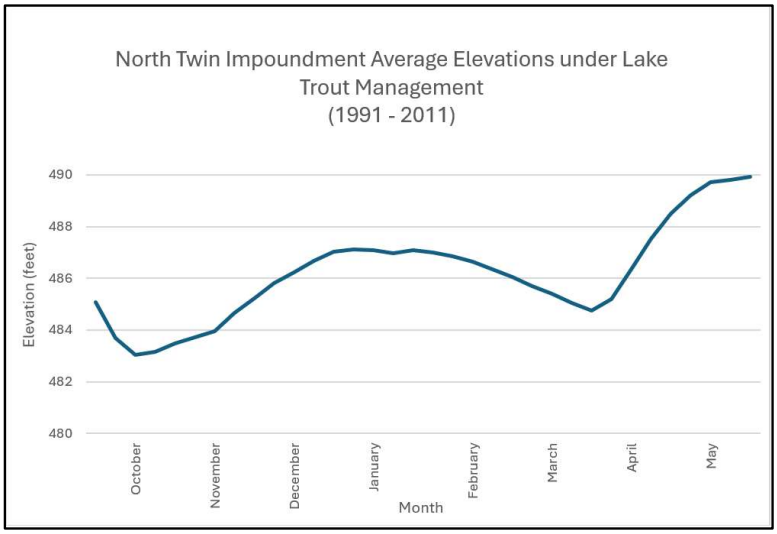


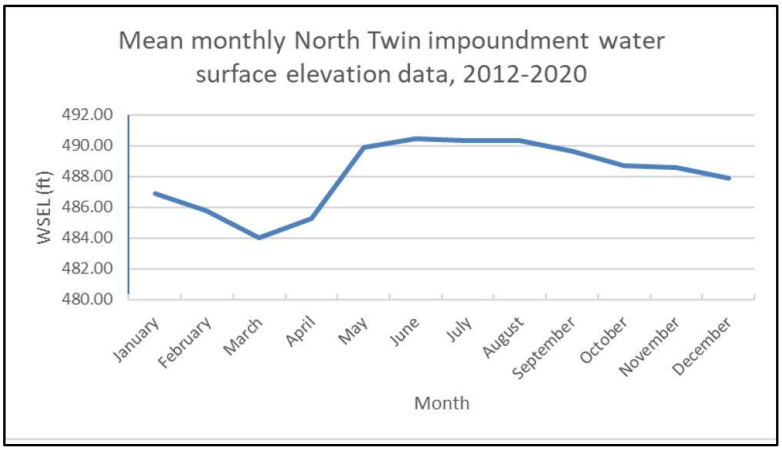

**Figure 2.**




Current water level management operations begin drawing the impoundment down in October during the start of landlocked salmon, lake trout and lake whitefish spawning seasons and continuing into March when the impoundment has begun to refill. This water level regime

dewaters shoreline and shoals after lake whitefish have spawned, potentially exposing redds and eggs, negatively affecting larval recruitment (Figure 3.).

**Figure 3. (adapted from "North Twin Impoundment Tributary Access Study Report, Figure 1-1, Appendix E-4)**




*North Twin Impoundment Recommendations*

Anticipating further discussions with the Licensee and other stakeholders regarding water management between the two Projects, MDIFW's preliminary recommendation is to maintain a fall minimum impoundment elevation similar to that of the previous Article 408, and that the impoundment elevation remain at or above 485 feet, based on findings of the North Twin Tributary Access Study, from October 1 through March 31.

***West Branch Downstream of Stone Dam***

*Habitat Suitability*

MDIFW's October 8, 2021, response to GLHA's PAD and Study Requests included a Minimum Flow Analysis be conducted for the West Branch Penobscot River below Stone Dam. The goal of this study was to inform the decision process for determining the best timing and extent of minimum flow releases required to maximize fishery resources in terms of both aquatic habitat and fishable opportunities in the river reach below Stone Dam (mainstem West Branch of the Penobscot River). The objectives of this study request included: generate a comparative analysis of the various scenarios for minimum flow levels that best addresses and/or maximizes the needs of inland fisheries resources within the river reach; evaluate how various minimum flows influence the fishable aquatic habitat in the various lotic and lentic areas of the river reach; and identify a minimum flow that will enhance aquatic habitat and recreational opportunities below the dam.

The study was requested to ensure that any agreed upon minimum flow releases occur at levels that meet inland fisheries needs. The amounts of minimum flow releases are required to maximize aquatic freshwater fisheries habitat and fishable habitat, as well as maximize benefits to the aquatic macroinvertebrate community. Due to changing MDIFW fisheries goals and growing angler pressures in the region, MDIFW is trying to establish a put-and-take fishery in this resource to provide more spring and fall angler opportunities.

In consultation with MDIFW, GLHA ran a desktop PHABSIM hydraulic model using data from an earlier Instream Flow Incremental Methodology (IFIM) Study for the West Branch downstream of Stone Dam (NAI 1989) but updating it with habitat suitability criteria that reflect contemporary resource management objectives.

Hydraulic modeling results show a flow range between 300 cfs and 500 cfs below Stone Dam will provide 92-100%, 74-95%, 99-100%, and 46-49% of maximum potential habitat suitability for juvenile brook trout, adult brook trout, juvenile landlocked salmon, and adult landlocked salmon respectively. Percent potential macroinvertebrate habitat suitability ranges from 83-95% at the same flows.

*Angler Flow Evaluation*

As part of the relicensing process and in conjunction with the flow analysis study, MDIFW requested GLHA conduct an Angler Flow Evaluation in the river reach below Stone Dam to help develop safe angler wading flows while maximizing suitable habitat for salmonids and macroinvertebrates.

Three different river flows (low, 93 cfs (or "leakage"); mid, 236 cfs; and high, 392 cfs) were angled by volunteers to determine, in part, 'ability to walk shoreline/bank', 'velocity of water for casting', and 'wadability'. Opinions varied somewhat based on level of angler experience, but 'ability to walk shoreline/bank' was ranked (from low flow to high) as good, good, and fair; 'velocity of water for casting' was ranked good, excellent, and excellent; 'wadability' was ranked as fair, good, and good.

Taken together, results of the habitat suitability study and angler flow evaluation suggest river flows in the 300-500 cfs range below Stone Dam will greatly benefit aquatic resources while providing good to excellent angler conditions in the river reach.

*West Branch Downstream of Stone Dam Recommendations*

Being conscious of other competing resources for water demand including power production and new recreational paddling and whitewater opportunities, while attempting to establish a seasonal (spring and fall) salmonid fishery and anticipating further discussions with the Licensee and other stakeholders regarding water management between the two Projects, MDIFW's preliminary recommendation is for a minimum flow from Stone Dam be set at 300 cfs between September 15 and June 30.

As stated earlier, access to surface waters of the State and their fishery resources are an important State and Department goal. As land ownership changes across the State, public access opportunities to water resources are challenged, while the demand for water based, outdoor activities climb. In Maine, MDIFW stocks coldwater species at many bypass and tailrace areas associated with hydropower projects when public access and minimum flows are suitable to support stocking programs. These stockings are typically very popular and can provide seasonal or year-round angling for coldwater or resident warmwater fish species.

MDIFW requests formal access improvements including improved vehicle access, signage, and parking provisions to the West Branch bypass area below Stone Dam. We request the Licensee work with MDIFW to ensure any access improvements made by the Licensee are suitable.

*Millinocket Stream*

As a condition of its 1996 FERC license, GLHA is required to stock brook trout annually in Millinocket Stream to help provide a regional fishery opportunity. Currently, 60 cfs is the minimum flow requirement for Millinocket Stream and is adequate for the fishery resources present. Anticipating further discussions with the Licensee and other stakeholders regarding water management between the two Projects, MDIFW's preliminary recommendation is maintaining the present 60 cfs minimum flow for Millinocket Stream.

Literature Cited

Maine Dept. of Inland Fisheries and Wildlife. 2015. Maine's wildlife action plan. Maine Dept. of Inland Fisheries and Wildlife, Augusta, ME.

Normandeau Associates, Inc. (NAI). 1989. Penobscot Mills Project. FERC No. 2458. Instream Flow Studies. Prepared for Great Northern Paper, Millinocket, ME. Prepared by Normandeau Associates, Bedford, NH. R-589. August 1989. 28 pp. plus appendices.

Whitaker, D. S. and Wood, J. 2021. An Investigation of Lake Whitefish Recruitment, Spawning, and Early Life History in Northern Maine: Final Report. Maine Department of Inland Fisheries and Wildlife Fisheries and Hatcheries Division

Wood, J. 2016. Current Status of Lake Whitefish in Maine; an Update to MDIFW's 2001 Whitefish Assessment. Maine Department of inland Fisheries & Wildlife

Wildlife Recommendations

*Maintenance of the Umbazooksus Lake Mitigation Area*

As stated above, the wetland mitigation activities performed at Umbazooksus Lake satisfied the wetland mitigation requirements for both the Ripogenus Project and the Penobscot Mills Project in the current license. Pursuant to the FERC-approved plan, GLHA discontinued storage and release operation in spring 1998 at Umbazooksus Lake by maintaining the outlet gate in a

permanently opened position, resulting in a run-of-river regime to lower water levels and enhance wetlands at Umbazooksus Lake.

As previously stated above for the Ripogenus Project, currently MDIFW is unable to accept solely the proposed Umbazooksus Lake Mitigation Area until fully analyzing the requested study results. MDIFW requests the Licensee work with MDIFW to better minimize these impacts by exploring changes to Project operations, as well as additional mitigation opportunities, as indicated above.

Rare Freshwater Mussels

As stated in our comments for the PAD, the Penobscot Mills Project Area supports both yellow lampmussel and tidewater mucket, and likely supports the brook floater. All three mussel species are designated as State Threatened and are afforded protection under Maine's Endangered Species Act (MESA, 12 M.R.S §12801 et. seq.)

We appreciate the Licensee notifying MDIFW regarding maintenance and other unexpected activities that have the potential to impact these species. While all inwater maintenance activities have the potential to impact listed mussels, drawing the impoundments down to more than annual maintenance events, especially drawdowns of extended durations, and/or abrupt changes in flow reductions beyond what is typically experienced, can significantly increase the risk of "Take" (kill or cause death) and/or "harassment" (create injury or significantly disrupt normal behavior patterns) of these species. MDIFW requests that the Licensee work with MDIFW to develop a strategy to minimize against Take of listed mussels, particularly during these more extreme draw downs and/or flow reduction maintenance events.

**Recreation Recommendations**

MDIFW supports the DLA recommendations of the Bureau of Parks and Lands regarding recreation and expanding recreational access and opportunities.

MDIFW looks forward to working with the Licensee's to resolve outstanding issues in anticipation of the Final License Application. Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,

John Perry
Environmental Review Program Supervisor

Cc: Francis Brautigam, Joe Overlock—MDIFW Fisheries Division, Augusta Headquarters
Tim Obrey, Jeff Bagley—MDIFW Fisheries Division, Region E

Kevin Dunham, Kevin Gallant—MDIFW Fisheries Division, Region F
Doug Kane, Scott McLellan—MDIFW Wildlife Division, Region E
Mark Caron, Lauren McPherson—MDIFW Wildlife Division, Region F
Casey Clark, MDMR
Laura Paye, MDEP
Jim Vogel, BPL
Kyle Olcott, USFWS
Jeff Murphy, NMFS

STATE OF MAINE
DEPARTMENT OF MARINE RESOURCES
21 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0021

JANET T. MILLS
GOVERNOR

PATRICK C. KELIHER
COMMISSIONER

August 1, 2024

Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject: Maine DMR comments on the Draft License Application for the Ripogenus (P-2572) and Penobscot Mills (P-2458) Hydroelectric Projects**

Dear Acting Secretary Reese:

On May 3, 2024, Great Lakes Hydro America, LLC (GLHA; Licensee) submitted their Draft License Application (DLA) for the Ripogenus (P-2572) and Penobscot Mills (P-2458) Hydroelectric Projects (Projects) on the West Branch of the Penobscot River in Maine. Enclosed are the Maine Department of Marine Resources (MDMR; Department) comments on the DLA for the Projects.

## EXECUTIVE SUMMARY

GLHA documented American eels downstream of all the Penobscot Mills projects and demonstrated a high probability of blade-strike and turbine mortality for adult American eels migrating downstream through the projects. The DLA asserts that the small number of eels observed at the projects indicates that mortality would not have population-wide effects and that protective measures are not needed at the project. MDMR disagrees with these assertions and notes that the American eel population within the project area is likely much higher than GLHA has observed, and the severity of predicted turbine mortality warrants protective measures at the projects in addition to appropriate measures for upstream passage. If the high level of impacts during downstream migration on the population of eels in the West Branch Penobscot are allowed to continue during the subsequent license term, the West Branch Penobscot will continue to have a detrimental impact on the population otherwise known as an ecological trap which is known to have population level impacts on American eels[1,2]. As a catadromous species, American eels migrate downstream when mature to spawn at which time they vulnerable to passage mortality at hydroelectric generating stations[3,4].

[1] McLaughlin et al. (2013). Unintended consequences and trade-offs of fish passage. Fish and Fisheries, 14, 580–604.
[2] Haxton, T. (2022). Cumulative downstream turbine-induced mortality and thresholds for facilitating upstream passage of American eel. *River Research and Applications*, *38*(3), 513-521.
[3] Heisey et al. (2019). Passage survival of European and American eels at Francis and propeller turbines. Journal of Fish Biology, 95, 1172–1183.
[4] Trancart et al. (2020). When “safe” dams kill: Analyzing combination of impacts of overflow dams on the migration of silver eels. Ecological Engineering, 145, 105741.

Reducing mortality on the silver lifestage of American eels is critically important, as was highlighted in the Addendum VII to the Fishery Management Plan for American Eel[5]. "The 2023 Benchmark Stock Assessment and Peer Review indicates the American eel stock remains depleted at or near historically low levels due to a combination of historical overfishing, habitat loss, food web alterations, predation, turbine mortality, environmental changes, toxins and contaminants, and disease (ASMFC 2023), consistent with the results of the 2012 and 2017 stock assessments." In the 2023 Benchmark American Eel Stock Assessment[6], ASMFC made recommendations for improving upstream and downstream passage for American eels. Specifically, "Blockages and obstructions that limit upstream migration of American eels have reduced habitat availability and limited the range of the species. Dams may also limit or delay downstream movements of spawning adults. Additionally, downstream mortality may be caused by hydroelectric facilities by impingement or turbine passage." We reiterate, the level of mortality and injury imposed on adult eels by the Project dams, during their downstream migration, is unacceptable and changes in Project structures and operations are necessary to protect fish immediately.

GLHA also asserts that upstream passage for anadromous species should not be required at the projects due to the limited amount of historic habitat upstream and the current existence of passage barriers downstream (Mattaceunk and Medway). However, the Licensee is incorrect in their assertion that the amount of habitat is a determinant on their responsibility to address avoidable impacts at the Projects. Indigenous aquatic species native to the section of the Penobscot River occupied by the Project, both above and below the Project dams, include diadromous fish. While the Licensee failed to do so in the DLA, the Licensee must demonstrate in the FLA that the waters of the West Branch Penobscot River, including where these waters flow through and over the Project dams, provide for the safe, timely, and effective passage of diadromous fish, ensuring that the river is of sufficient quality to support all indigenous aquatic species and that the discharge of the river water from the dam does not cause an adverse impact to indigenous diadromous fish. Furthermore, fish passage is already planned at the Mattaceunk project (see our comments on the DLA below), and MDMR intends to recommend passage at Medway as well in close consultation with the Maine Department of Inland Fisheries and Wildlife (MDIFW) to achieve both the improvement of fish passage for indigenous species and prevention of the spread of aquatic invasive species.

The Department of Marine Resources looks forward to further collaboration with the Licensee on addressing impacts to diadromous fish at the Ripogenus and Penobscot Mills projects. Please contact Casey Clark (casey.clark@maine.gov; 207-350-9791) or Lars Hammer (lars.hammer@maine.gov; 207-557-1564) if you have any questions.

Sincerely,



Patrick C. Keliher, Commissioner

[5] Atlantic States Marine Fisheries Commission (2024) Addendum VII to the American Eel Interstate Fishery Management Plan. Approved May 2024. https://asmfc.org/species/american-eel

[6] American Eel Benchmark Stock Assessment Subcommittee and Peer Review Panel (2023) American Eel Benchmark Stock Assessment and Peer Review Report. Accepted for Management Use by the American Eel Management Board August 1, 2023. https://asmfc.org/species/american-eel

MDMR DLA Comments

Exhibit E

PDF page 232: "American eel have been documented in Ripogenus impoundment historically, but during consultation with MDIFW prior to the 2022 assemblage sampling, agency staff noted that American eel had not been observed in over 7,000 hours of gill net and trap net sampling upstream of Chesuncook Lake (Ripogenus impoundment) (personal communication, Tim Obrey, MDIFW, Regional Fisheries Supervisor, with Kevin Bernier, Senior Compliance Specialist, GLHA, April 27, 2022), suggesting a very low density for this species."
MDMR Comment: Although MDIFW spent considerable time sampling the impoundment, their methods were not intended to document American eel. Gill nets, in particular, are biased towards fishes with fusiform body shapes and are not effective at capturing American eels, and thus gill net sampling would not provide reliable information to describe the eel population in the impoundment.

PDF Page 264: "However, under the Strategic Plan, upstream fish passage for anadromous species is not planned in the near term in the West Branch (MDMR and MDIFW 2008)…"
MDMR Comment: The 2008 Strategic Plan states, "American eel, American shad, and Atlantic salmon historically utilized portions of the West Branch Penobscot, but the 10 hydropower and water storage dams on the West Branch Penobscot do not pass diadromous fish and no passage is planned in the near term."[7] While the historic habitat for these species and alewife was identified in the plan, no passage was planned or supported by the licensee for the Projects in 2008. The absence of upstream passage facilities at the Projects prevents upstream passage for most diadromous species, including sea-lamprey not explicitly mentioned in the plan, and inhibits the passage of American eels. Therefore, there was no path at the time of writing of the 2008 Strategic Plan for restoration of diadromous species to the historic habitat in the West Branch Penobscot. These impacts are in direct conflict with MDMR's goal for the Penobscot River in the 2008 Strategic Plan, which is an accepted comprehensive plan. "The Department's goal for the Penobscot River is to restore, protect, enhance and manage self-sustaining[8] populations of native diadromous alewife, American shad, American eel, Atlantic salmon, Atlantic sturgeon, Atlantic tomcod, blueback herring, rainbow smelt, sea lamprey, shortnose sturgeon, and striped bass within their historical habitat in the Penobscot River basin for broad-based public use and benefit." Since the 2008 Strategic Plan was approved, two mainstem dams in the lower Penobscot River have been removed, a third has been decommissioned with the installation of a nature-like fishway, and a fourth has received a new fishway and other measures for fish passage. In addition, MDMR and our partners have made significant investments in passage or removal at non-hydro dams, replacement of culverts and other infrastructure to address barriers to diadromous fish, and reintroducing diadromous fish to historic habitat in all parts of the Penobscot watershed except the West Branch. Now is the appropriate time to include upstream and downstream passage infrastructure at a subset of the West Branch dams to pass anadromous species upstream into historic habitat. If upstream and downstream passage infrastructure is not included in the subsequent licenses for these projects the Department's goals and the benefits to the people of the State of Maine will not be realized for at least another 40 years.

[7] Maine DMR (Dept. Marine Resources) and IFW (Dept. Inland Fish and Wildlife). 2008. Strategic Plan for the Restoration of Diadromous Fishes to the Penobscot River.
[8] "Self-sustaining populations spawn in the wild, and migrate to and from the ocean with a minimum of human interference."

PDF Page 265: “Only 1.7 percent of American shad and blueback herring historical habitat is in the West Branch (MDMR and MDIFW 2008).”
MDMR Comment: While the Licensee’s information is correct in this case, 1.7% equates to almost 26,000 American shad and approximately 112,000 blueback herring (i.e., not an insignificant number of fish). In addition, the licensee does not consider the potential benefits of passage in the West Branch to Atlantic salmon and sea lamprey.

PDF Page 265: “As FERC described in its SPD, Atlantic salmon, alosines, and sea lamprey do not reach the Penobscot Mills Project given that there is no fish passage at the Medway Project, and a new upstream fishway is not planned for the Mattaceunk Project until 2037.”
MDMR Comment: This comment is irrelevant as the Medway project is currently undergoing relicensing as well, and Maine DMR will recommend fish passage measures at the Medway project in close consultation with MDIFW to achieve both the improvement of fish passage for indigenous species and prevention of the spread of aquatic invasive species as agreed to in a 2024 MOU between the two agencies. An upstream fishway is planned to be operational at the Mattaceunk project in year 16 of the license issued in 2021, so upstream anadromous measures should be included at a subset of the West Branch dams in the Final License Application along a similar timeline to avoid additional years of impacts on diadromous populations in the Penobscot River. MDMR also requests that the Licensee and FERC clarify that year 16 of the Mattaceunk license is indeed 2036, and not 2037 as stated on Page 265. The FERC Order issuing a new license for the Mattaceunk project was issued on February 26, 2021.[9] See the below table for tabulation.

| First year | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Year 11 | Year 12 | Year 13 | Year 14 | Year 15 | Year 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 |

PDF Page 269: “While major American shad restoration efforts are occurring in the lower Penobscot River drainage, American shad are not targeted for restoration in the West Branch (MDMR and MDIFW 2008).”

PDF Page 269: “However, there is limited historical spawning and rearing habitat available in the West Branch, and river herring are not targeted for restoration in the West Branch (MDMR and MDIFW 2008).”
MDMR Comment: See previous comments. The West Branch could provide habitat for approximately 26,000 American shad and 112,000 blueback herring. The 2008 Strategic Plan did not identify restoration in the West Branch because “…10 hydropower and water storage dams on the West Branch Penobscot do not pass diadromous fish and no passage is planned in the near term.”[10]. However, in the 16 years since the adoption of the 2008 Strategic plan there has been a focus on improving passage at projects in the lower river and now is the appropriate time to see passage in the West Branch to allow restoration of diadromous species to those historic habitats.

PDF Page 269: “The current and historical distribution of sea lamprey throughout the Penobscot watershed is relatively unknown (Saunders et al. 2006).”

[9] Accession No. 20210226-3016
[10] Maine DMR (Dept. Marine Resources) and IFW (Dept. Inland Fish and Wildlife). 2008. Strategic Plan for the Restoration of Diadromous Fishes to the Penobscot River.

MDMR Comment: MDMR assumes that the distribution of sea lamprey throughout the Penobscot watershed is comparable to that of Atlantic salmon due to their similar habitat requirements.

PDF Page 273: "Given that Stone Dam is a low head dam with a good amount of leakage from the flashboards, it is likely that small juvenile eels can ascend the river right side of the dam."
MDMR Comment: Although current conditions at Stone Dam may allow some eel passage over or through existing features, there is no evidence that this passage is safe, timely, or effective for eels. Observations of potentially favorable passage conditions do not preclude the need for siting studies or installation of upstream passage infrastructure.

PDF Page 274: "Given that Millinocket Lake Storage Dam has a low head, a curved profile, and a good amount of flow through existing notches, American eels are likely able to migrate over or through existing features at the site."
MDMR Comment: Although current conditions at Millinocket Lake Storage Dam may allow some eel passage over or through existing features, there is no evidence that this passage is safe, timely, or effective for eels. Observations of potentially favorable passage conditions do not preclude the need for siting studies or installation of upstream passage infrastructure.

PDF Page 279: "A cumulative survival estimate for male sized eels was not calculated as results from larger female sized eels were considered to be a worst-case scenario."
MDMR Comment: The licensee's cumulative survival estimate clearly demonstrated significant impacts to American eels throughout the West Branch, with some projects exhibiting 100% blade-strike probability for adult eels (of either sex) passing through the turbines. Table 37 in the ISR[11] indicates that only 6.4% of eels would survive passage of Ripogenus and all of the Penobscot Mills projects. While this estimate is already staggeringly low, downstream migrating eels are further impacted by at least four additional downstream dams before they reach the ocean. Under current conditions, the impacts from the West Branch projects are likely an ecological trap as described in our summary comments. A watershed wide estimate of cumulative mortality is important and is under development by MDMR and USFWS. This watershed wide estimate will be filed on the record as soon as we have completed agency review.

PDF Page 306: "As such, operation of the Ripogenus Project impoundment as proposed, is not expected to affect American eels"
MDMR Comment: While operation of the impoundment is unlikely to directly kill or injure American eels in the headpond, large drawdowns that occur at the project are likely to reduce the forage base in Ripogenus Lake that is available for American eels, which would impact growth and survival in the same way that it impacts resident species.

PDF Page 311: "No eels were observed during the 2022 Fish Stranding Study downstream of McKay Station. As such, proposed operations of the Ripogenus Project are not expected to affect American eels in the West Branch downstream of the Ripogenus Project or in the impoundment.
MDMR Comment: An American eel was observed during the 2024 Ramping Study that the Licensee conducted on July 17, 2024[12]. It is also reasonable to assume that the eel population in the habitat downstream of McKay station are depressed from historical levels due to the lack of passage at the Penobscot Mills and other dams downstream. Once upstream passage is provided at the downstream

[11] Accession No. 20230424-5265
[12] This documentation was emailed to Alicia.Jackson@ferc.gov on July 30, 2024.

dams, we expect eel populations in the habitat in the West Branch Penobscot to increase and larger populations of eels could be impacted at a higher rate by proposed operations of the Ripogenus project downstream of the project from a stranding perspective. In addition, it is completely inappropriate to say that operation of the project will not impact American eels in the impoundment. In fact, the Licensee's own analysis indicates that 11% of eels 15" in length and 0% of eels 28" in length would survive passage downstream of the project.

PDF Page 315: "Management of anadromous fish species (e.g., Atlantic salmon, river herring, sea lamprey, and American shad) in the West Branch is not envisioned under current, published management plans for the Penobscot River (MDMR and MDIFW 2008)."
MDMR Comment: This comment is incorrect and misinterprets the 2008 Strategic Plan. See our above comment on this subject.

PDF Page 315: "Based on 2022 and 2023 study results, juvenile eels are finding upstream passage routes at all of the Penobscot Mills Project dams. The greatest number of eels were observed at Dolby Dam, Millinocket Lake Storage Dam, and East Millinocket Dam, respectfully. The number of eels observed at Stone Dam and North Twin Dam were an order of magnitude lower than at all other locations; all eels at the North Twin Dam were seen in the existing fish ladder designed to pass landlocked salmon. As such, GLHA's proposed operations would be expected to maintain opportunities for American eels to move upstream at the Penobscot Mills Project."
MDMR Comment: While some eels are finding upstream passage routes, there is no information to determine that these existing routes provide safe, timely, and effective passage for American eels. Installation of specific eel passage infrastructure would provide a dedicated route of passage for American eels at the projects. Proper monitoring and if necessary, improvements, would ensure safe, timely, and effective passage.

PDF Page 316: "Under GLHA's proposed operation of the Penobscot Mills Project, there would be no change to these potential survival rates for downstream migrating adult silver eels. However, given the relatively small numbers of eels reaching the Penobscot Mills Project impoundment waters and, therefore, needing to pass back downstream past the various dams/powerhouses, it is not clear that the existing mortality rates would have any significant effect at the population level."

PDF Page 318: "Unavoidable adverse impacts resulting from continued operations of the Ripogenus Project and Penobscot Mills Project may include entrainment or impingement of downstream migrating adult silver eels. However, because relatively few eels reach the West Branch (as compared to lower in the Penobscot River watershed), it is unlikely that proposed operations would have a significant effect on American eels at the population level."
MDMR Comment: While there are certainly adverse impacts to downstream migrating adult silver eels resulting from current operations of the Ripogenus and Penobscot Mills projects, these impacts are not "unavoidable" as the Licensee suggests. The best scientific information available suggests that entrainment and impingement can be limited or avoided entirely with the installation of ¾" angled trashracks and appropriate downstream bypasses[13].

GLHA's conclusions that there are relatively small numbers of eels reaching the Ripogenus and Penobscot Mills impoundments are based on very limited information. For example, the licensee

[13] USFWS (U.S. Fish and Wildlife Service). 2019. Fish Passage Engineering Design Criteria. USFWS, Northeast Region R5, Hadley, Massachusetts.

observed 2,045 eels below Dolby dam across only 7 nights of observation, which in and of itself is a significant number of eels. If we assume that GLHA's observations encompassed the entire upstream passage season for American eels (i.e., the entire season was 7/27-9/5), and that the number of eels observed was representative of upstream passage each night, then it is possible that GLHA would have observed over 13,000 eels if they had monitored every day during that time period. While this is an extremely simple example, we do know that GLHA's observations did not cover the entire upstream passage season (typically June-August), 230 eels were still observed during the last survey in early September, more surveys would have resulted in more eels, and no surveys at Dolby were conducted during rain events, which may have increased the number of eels observed. Thus, it is likely that the number of eels interacting with these projects is much larger than the numbers GLHA has observed, and downstream mortality and poor upstream passage would have significant effects at the population level.

cc: MDMR, Sean Ledwin
NMFS, Jeff Murphy, Don Dow, Dan Kircheis
MDEP, Robert Wood, Laura Paye
MDIFW, John Perry, Tim Obrey, Kevin Dunham
USFWS, Kyle Olcott, Amanda Cross

**Maine Professional River Outfitters**

August 1, 2024

Debbie-Anne A. Reese
Acting Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Re**: Ripogenus Project (P-2572) and Penobscot Mills Project (P-2458)
Comments on Draft License Application

Dear Secretary Reese:

Maine Professional River Outfitters ("MEPRO") is an unincorporated organization of commercial rafting outfitters that operate on a fourteen mile stretch of the Penobscot River, from below McKay Station to Nevers Corner. Maine's rafting industry plays a vital role in bolstering the State's rural economy by attracting tourists and providing employment opportunities in remote areas. We appreciate the opportunity to provide comments on licensee's draft license application ("DLA") submitted on May 3, 2024.

## Introduction

As an initial matter, MEPRO reiterates and incorporates its July 6, 2023 comments on licensee's Initial Study Plan and its June 30, 2024 comments on the Updated Study Report. MEPRO's primary objectives are (1) to maintain and protect the historic flows the industry has come to rely on, (2) to ensure that the licensing process carefully considers the licensee's obligations to the commercial rafting industry, and (3) to ensure the license provides sufficient mechanisms to support the continued success of the commercial rafting industry in Maine.

## Ensuring Adequate Flow During Recreation Hours

As explained in our comments on July 6, 2023, MEPRO is a party to a 1993 settlement agreement with Great Northern Paper, Inc. that resolved issues related to the commercial rafting industry raised during the previous relicensing process (the "1993 Settlement").

Maintaining the flows provided for in the 1993 Settlement is absolutely critical to the continued success and viability of the commercial rafting industry in Northern Maine. Under the existing FERC license, commercial rafters and the whitewater rafting industry have historically had recreation flows from May 1 - September 15 between the hours of 8:30am-5:00pm. MEPRO seeks to ensure these recreation flows are preserved and it respectfully submits that a refinement of the water release protocol is necessary to fully satisfy that arrangement.

Specifically, in order to ensure that recreational flows are available during the agreed upon hours, we request earlier releases that will enable recreation level flows to reach all commercial access points (McKay and Nesowadnehunk) by 8:30am as contemplated in the Operations Model Logic and Validation Report.[1]

Under the existing license, the agreed-upon flows are set forth below:

| ***Whitewater*** | |
|---|---|
| May 1 – September 15<br>(8:30 AM – 5:00 PM) | Normal hydrologic year[3]:<br>• 2,300 cfs on Saturdays and Sundays<br>• 2,200 cfs on Mondays and Fridays<br>• 2,000 cfs on Tuesdays through Thursdays<br>Wet or dry hydrologic year[3]:<br>• 2,200 cfs on Saturdays and Sundays<br>• 2,000 cfs on Mondays and Fridays<br>• 1,800 cfs on Tuesdays through Thursdays |
| September 16 – October 1<br>(8:30 AM– 5:00 PM) | Normal hydrologic year[3]:<br>• 2,300 cfs on Saturdays and Sundays<br>Wet or dry hydrologic year[3]:<br>• 2,200 cfs on Saturdays and Sundays |
| June 8 – October 14<br>(5:00 PM – 8:30 AM) | 1,000 cfs |

Recreation flows are guaranteed from 8:30am-5:00pm, with a minimum of 1800 cfs being released during a wet/dry year on certain days of the week. The minimum flow required to run a safe and enjoyable whitewater rafting trip are the flows that are currently required in the license–including a minimum of 1800 cfs on a wet/dry year, and 2000 cfs on a normal year.

Our members have experienced that, in a dry year, when the turbines may be dropped to just one operating turbine overnight, an earlier release is needed to ensure the recreation flow reaches McKay and Nesowadnehunk Falls by 8:30am. To illustrate, some of our members put their rafts in at 8:30am at McKay Station for a full river trip, which could mean taking out as late as 5:00pm at Nevers Corner. Other members begin their trips by putting-in at Nesowadnehunk Falls and run the McKay Station portion of the river after lunch. Outfitters are given specific launch times and locations by the Department of Inland Fisheries and Wildlife, and our members want to ensure adequate flows reach the entire fourteen mile stretch on which we operate by 8:30am and are

[1] *See* Section 5.2.3.5 Recreation Flows, *Appendix A: Operations Model Logic and Validation Report* (April 2024).

maintained until 5:00pm. Under the current permitting regime, when flows have dropped below 2000 cfs overnight, outfitters have experienced low water during the identified recreation hours of 8:30am to 5:00pm. This inhibits their ability to begin river trips on time, negatively impacting user experience and making scheduling less predictable.

Based on our experience working and recreating on the Penobscot River, we submit an earlier release from McKay Station when flows are dropped below 2000 cfs overnight is necessary to ensure sufficient recreational flows make it to Nesowadnehunk Falls by 8:30am for our members who put in there. Commitment to an earlier release time under low flow scenarios will allow the whitewater industry and its customers to have confidence that recreation flows will reach launch points at a time and in a manner that enables predictable launch times, and a consistent flow throughout the river for running rapids. MEPRO wants to ensure that the license provides the whitewater rafting industry with adequate flow for running the river throughout the fourteen-mile section we raft, beginning at 8:30am, whether putting in at McKay Station or Nesowadnehunk Falls.

To be clear, MEPRO is not proposing any changes to the minimum flow requirements in the existing license, but rather an enhancement to the process undertaken to increase the low flow up to the recreation flow by the start of designated recreation hours, due to slow fill in Nesowadnehunk Dead Water and Abol Dead Water.

Consistent and predictable flows are critical to the smooth and successful operation of the commercial rafting industry. MEPRO and its members want to ensure the license creates a requirement to maintain these flows during the full breadth of the designated recreation hours. The simple act of preserving our existing arrangement will provide significant benefits to support outdoor recreation and tourism, which, with the decline of other industry, has become the number one industry in the area and is increasingly important to Maine's rural economy.

**Gage Installation**

MEPRO members support installation of U.S. Geological Survey ("USGS") streamflow gage(s) as described in the USGS Gage Feasibility Study Report.[2] The Report indicates that streamflow gages would use satellite technology to transmit near real-time data about flows. Having access to contemporaneous data about flows would provide the whitewater rafting industry with actionable information to aid in monitoring water levels and scheduling rafting trips.

[2] *Appendix B: U.S. Geological Survey Gage Feasibility Study.*

The Report concludes that an appropriate location for a USGS gage would be in the vicinity of the Big Eddy Campground. As the licensee notes, "if a USGS gage is installed in the vicinity of Big Eddy, stakeholders will be able to understand flows from previous hours, which will inform whether boating flows are available at the downstream Abol Bridge."[3] As stated in its June 30, 2024 comments, MEPRO continues to recommend installation of USGS gages in two locations: (1) somewhere in the area between Telos Bridge and Big Eddy and (2) in the vicinity of Abol Bridge. Placing USGS-maintained gages at these locations would confirm whether adequate recreation flows (up to the agreed-upon historic flows) are reaching whitewater rafting put-ins at McKay Station and Nesowadnehunk Falls by the start of recreation hours.

**Repair and Maintenance of the McKay Station Put-In**

MEPRO and its members reiterate our request that the license require timely and regular repair and maintenance of any licensee-controlled put-ins. MEPRO and its members are particularly concerned that the McKay Station put-in is still in need of repair work following the last damaging high-water event.

The license should require all repair and maintenance of put-ins following spillover events at Ripogenus Dam to be completed by May 1 each year. MEPRO and its members depend on the put-ins being in safe, working order to access the river and operate our businesses. A May 1 deadline to complete put-in repair and maintenance would ensure the river access points would be ready to accommodate commercial rafting trips on the Penobscot River at the start of each season. We also request the license requires reasonable efforts to repair put-ins in a timely manner following any mid-season spillover events.

**Additional Access Point in the Vicinity of Abol Bridge**

MEPRO members, along with other stakeholders, support the construction of additional access and egress points along the section of the Penobscot River on which we operate. MEPRO formally requests an additional access point at Abol Bridge, specifically a hand-carry access put-in for commercial use on river right just below the bridge or at another appropriate site in the vicinity with suitable parking.

MEPRO members have seen an increased demand for less challenging river trips. These types of less adventurous river trips are not currently available on the West Branch of the Penobscot River. A suitable access/egress point in the vicinity of Abol Bridge would help satisfy this demand by accommodating those clients who seek a less strenuous river trip.

[3] GLHA Response to Comments on the Update Study Report and Requests for New or Modified Studies at page 33 (Jul. 30, 2024).

Additionally, an access/egress point in the vicinity of Abol Bridge would be particularly beneficial during flood stage water levels when it is nearly impossible to safely run the river from either Ripogenus Gorge or Nesowadnehunk Falls. An Abol Bridge access/egress point would allow the industry to access the River when flood stage water levels make it too dangerous to run the upper rapids.

**Improved Access to Debsconeag Falls**

Finally, MEPRO members agree with other stakeholders that the license should require road improvements to the Debsconeag Falls access road. Debsconeag Falls is a class 4/5 rapid located just over two miles below the existing Nevers Corner commercial rafting take out. However, the Debsconeag Falls rapid is rarely utilized (either by private boaters or the commercial rafting industry) due to the poor quality of the access road leading to it.

Improvements to the Debsconeag Falls access road would provide an additional class 4/5 whitewater boating opportunity without any changes in required flows or other system management changes. MEPRO and its members formally request the license require improvements to and maintenance of the Debsconeag Falls access road which will improve access the river and increase the quantity and variety of commercial rafting trips the industry can offer.

**Conclusion**

MEPRO's primary goal is to protect and maintain the water levels the whitewater rafting industry has historically enjoyed and relies on for its continued operational success. Our other comments make reasonable requests of the licensee that will improve the commercial rafting industry's access to the River and ability to offer a diverse array of safe and enjoyable whitewater trips. Thank you for the opportunity to provide these comments.

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Great Lakes Hydro America, LLC
Application for New License

Ripogenus Hydroelectric Project
FERC No. 2572

Penobscot Mills Hydroelectric Project
FERC No. 2458

# JOINT NGO STAKEHOLDER COMMENTS ON DRAFT LICENSE APPLICATION FOR THE RIPOGENUS HYDROELECTRIC PROJECT (P-2572) AND PENOBSCOT MILLS HYDROELECTRIC PROJECT (P-2458)

American Whitewater ("AW"); Appalachian Mountain Club ("AMC"); Maine Council of Trout Unlimited ("TU"); American Rivers ("AR"); Maine Rivers; Atlantic Salmon Federation ("ASF"); Caribou, Chesuncook Lake Camp Associations; Chesuncook Dam Camp Owners Association; the Allagash Gateway Campground; and Andre Emerson Cushing Corporation (collectively, "NGOs" or "Signatories") submit the following Comments in response to the filing of the Draft License Application for the Ripogenus Hydroelectric Project and Penobscot Mills Hydroelectric Project (FERC Project Nos. P-2572, P-2458) by Great Lakes Hydro America, LLC ("GLHA") Collectively, these projects are located on the West Branch of the Penobscot River and Millinocket Stream and are comprised of the Ripogenus Hydroelectric Project and the Millinocket Lake Storage, North Twin, Millinocket, Dolby, and East Millinocket developments as part of the Penobscot Mills Hydroelectric Project. While GLHA holds separate licenses for the Ripogenus and Penobscot Mills projects, the licensee has appropriately jointly filed a Draft License Application because GLHA is the licensee for both projects, they have the same license expiration date, and the operations of both projects are inextricably linked. Throughout the Integrated Licensing Process utilized for this relicensing, GLHA has held joint Initial Study Report and Updated Study Report meetings as well as joint meetings concerning ongoing studies applicable to both projects including recreation, aesthetics, and project operations. Inasmuch as these projects have cumulative impacts on both developmental and non-developmental resources, we are jointly filing these comments on the Draft License Application for both projects as a single document under each FERC docket to support a coordinated approach to the relicensing of these projects and to advocate for the preparation of a single NEPA document addressing the cumulative impact of all six developments.

American Whitewater is a national non-profit 501(c)(3) river conservation and recreation organization founded in 1954. With approximately 6,000 members and 85 affiliate clubs, representing tens of thousands of whitewater paddlers across the nation, American Whitewater's mission is to protect and restore our nation's whitewater resources and to enhance opportunities to enjoy them safely. Our members are primarily conservation-oriented kayakers and canoeists, many of whom live and/or engage in recreational boating in the New England region within easy proximity of the Penobscot River. American Whitewater has long been involved with the FERC licensed hydropower projects in the Maine, including hydropower projects located on the Penobscot, Kennebec, Rapid, and Magalloway rivers, and are party to settlement agreements that provide for whitewater boating opportunities that

partially mitigate for project impacts.

Since 1876, the Appalachian Mountain Club has promoted the protection, enjoyment, and understanding of the mountains, forests, waters, and trails of the Appalachian region. AMC is the largest conservation and recreation organization in the Northeast with more than 90,000 members, supporters, and advocates, many of whom visit the lands and waters upstream and downstream of the projects for recreation.

Maine Council of Trout Unlimited represents six local chapters with over 2,000 fisher-conservationists in Maine. The mission of the organization is to bring together diverse interests to care for and recover rivers and streams so our children can experience the joy of wild and native trout and salmon. The entire watershed of the West Branch of the Penobscot is especially important to a great many of our members who enjoy its fishing resources, including the area from McKay Station to Nesowadnehunk Falls, Ripogenus-Chesuncook-Caribou Lake, and the waters below to its confluence with the main stem of the Penobscot River that are greatly affected by the Ripogenus and Penobscot Mills projects.

American Rivers is a national non-profit organization whose mission is to protect wild rivers, restore damaged rivers, and conserve clean water for people and nature.

The Caribou and Chesuncook Lake Camp Associations represent the interests of those with property on the shores of these lakes who have been greatly affected by the severe dewatering of the Ripogenus-Chesuncook impoundment in recent years. Their interest also extends to other recreational users of the lakes including the many canoe campers, recreational boaters, fishermen and women, those who use the public campsites on the lakes as well as the aquatic and shoreline communities who make their homes there.

Maine Rivers, begun in 1998 as a project of the Natural Resources Council of Maine, became an independent organization in 2003. The Maine Rivers mission is to protect, restore and enhance the health and vitality of Maine's rivers. Since the Clean Water Act was passed in 1972, the health of Maine's Rivers has improved dramatically, but there are still serious threats to our rivers – from the toxins that wash in with every rain storm, to the pollution discharged by paper mills, to water withdrawals by farmers and ski resorts. Maine Rivers recognizes that the destructive impacts that colonization and industry have on our rivers also degrade and destroy human life, and seek to find better ways to safeguard Maine's countless miles of remarkable rivers.

Atlantic Salmon Federation is an international non-governmental organization dedicated to the conservation and restoration of wild Atlantic salmon and their ecosystems. ASF represents more than 25,000 members and volunteers across North America. ASF conducts research on wild salmon throughout the North Atlantic, performs complex river restoration project, promotes conservation of critical salmon habitats, and advocates for legislation and policies that will help to protect wild Atlantic salmon. ASF's U.S. office is located in Brunswick, Maine.

Allagash Gateway is a four-season sporting camp located on Ripogenus Lake near the Chesuncook Dam Point Boat Launch. It offers a private boat launch, canoeing, campsites, lodging, guide services, and a small store. During the summer months, Allagash Gateway's clientele is primarily interested in boating and fishing the lakes that make up the Ripogenus impoundment. Operations of the campground have

been profoundly impacted over the last few years by the water levels of Ripogenus Lake and Chesuncook Lake.

Andre Emerson Cushing Corporation is the majority landowner in T3 R12 WELS. Approximately 80% of Ripogenus Lake and 20% of Chesuncook Lake are within the boundaries of T3 R12 WELS. William Cushing, a director of Andre Emerson Cushing Corporation, is a year-round resident of T3 R12 WELS, and his home is on Ripogenus Lake.

These organizations are working together to represent the interests of all stakeholders, including fish and wildlife, to the Commission in the most consistent and coherent way possible. Individual organizations may submit additional DLA Comments to supplement and support this filing.

**General Comments**

The West Branch of the Penobscot River is one of the nation's premier natural, scenic, and recreational wonders. Water flowing over many millennia has sculpted the bedrock, river channel and landscape from the Ripogenus Gorge to Millinocket into a series of remarkable geological and scenic features that make this river a unique recreational and natural resource. Ripogenus Dam causes the merging of Ripogenus Lake, Chesuncook Lake and Caribou Lake in to Maine's third largest lake that provides unique recreational and scenic opportunities. The operation of large hydroelectric power plants, dams and other associated structures degrades the public's use and enjoyment of this unique and spectacular public resource.

Since the last license was issued, Project Operations have changed significantly. Great Northern Paper (GNP) operated the projects to keep a steady flow of water going downstream to power the operation of its East Millinocket Mills. Since splitting off its hydro operations to Great Lakes Hydro America, LLC, the project has been operated using peaking flows to increase profits from the electricity generated that is now sold on the grid, and use of this practice has increased under Brookfield Renewable's ownership. The current license prescribes minimum flows that partially address recreational and environmental concerns. Additional terms and conditions are needed to improve water management and balance project harms and benefits given the changes to project operations. It is clear from the record of the last relicensing that agencies and officials bent over backwards to license the projects under terms and conditions favorable to GNP's economic interests. Those interests are not longer relevant to the proceeding as the paper mills that once dominated the region are long gone. The terms and conditions of the current license, however, are not compliant with current Maine environmental statutes or federal hydropower regulations. Example: FERC does not issue storage project licenses without specifying target fill date and level or minimum drawdown levels. Under the terms of the current license, Ripogenus-Chesuncook-Caribou Lake may be drawn down to the physical limits of Ripogenus Dam.

Since the filing of the Pre-Application Document on June 11, 2021, stakeholders in this relicensing including American Whitewater, Appalachian Mountain Club, Trout Unlimited, Penobscot Indian Nation, whitewater outfitters, lake owners, state and federal resource agencies, individual recreationists, and others have filed scores of comments on the FERC docket, requested

relicensing studies, participated in study implementation, attended study report meetings, and meaningfully and substantially participated in the relicensing process. Notwithstanding the importance of the issues and concerns raised by stakeholders throughout the relicensing process, GLHA and filed a Draft License Application that ignores the result of every study and ignores the written and oral comments provided by every relicensing stakeholder. Instead, GLHA has filed a Draft License Application that proposes no changes whatsoever in is current operations with no analysis, seemingly treating the relicensing process as a waste of time and money and little more than a check-the-box exercise, expecting FERC to simply issue a new license under the same terms and conditions. The DLA states: "GLHA proposes to continue operating the Projects as described above during mean/normal, high, and adverse/low water years." [Exhibit B, page B-11] This is despite the fact that Brookfield has yet to identify the data supporting those same flows in the license nothwithstand FERC Staff's specific request for this information. The relicensing process demands more. So does NEPA, the Federal Power Act, and the Clean Water Act.

**Description of Project Facilities and Operations**

From the top of the Ripogenus impoundment to the East Millinocket tailrace, these storage projects and hydropower dams impact more than 40 river miles of the West Branch of the Penobscot River and more than 12 river miles of Millinocket Stream. The uppermost development, Ripogenus Hydroelectric Project, obstructs more than 20 miles of the West Branch of the Penobscot River by diverting flows at the Ripogenus Dam into a 3,850-foot-long penstock leading to the McKay Station powerhouse. The drainage area of the project is 1422 sq. mi.

Ripogenus-Chesuncook-Caribou Lake has a surface area of 26,200 acres and is Maine's third largest lake. The current license allows lake levels to vary restrained only by the physical structure of Ripogenus Dam. The lake was not filled during the years 2020 and 2021 and was finally filled during the winter of 2022 by dropping outflows to 1000 cfs and subsequently 800 cfs, well below licensed spawning flows and undoubtedly having significant negative impact on the redds of salmonids downstream.

Chesuncook is unique. It is of highest value, developed mainly on the north and south shores with future development limited, and yet is still accessible. Further demonstrating the lake's status as a valued fishing, boating and canoeing destination, Maine statute prohibits jet skis from Chesuncook, Caribou and Ripogenus lakes. These lakes are remote, wilderness gems.

Chesuncook Lake's remoteness and undeveloped nature is what makes it so important to the state of Maine. So valued that the State of Maine employs a full-time Lake Ranger, May through October to monitor and maintain the public campsites on Chesuncook Lake, including Umbazookus and Gero Island. This ranger assists the numerous public, private and commercial canoe campers, recreational boaters and fishermen and women who use the lake including Bowdoin College, Colby College, Outward Bound, the Sierra Club, the LL Bean Discovery Program, and numerous private fishing and canoe camps and outfitters.

The lake is steeped in history. The Wabanaki–Thoreau Canoe Trail, a 200-mile network of paddling and hiking routes once used by Henry David Thoreau and members of the Wabanaki Nations, passes through Chesuncook Lake. The lake also hosts the Northern Forest Canoe Trail. This 700-mile trail is

the longest water trail in the nation spanning New York to Maine on traditional routes used by Indigenous peoples, settlers and guides.

The pristine beauty of Chesuncook Lake attracts recreational users today to the remote campsites and the developments at the north and south end. At the north end of the lake lies Chesuncook Village. A bustling community with an active church and museum, and a large, quintessential, iconic lodging facility. Just across from the village, is Gero Island, a state Ecological Preserve within public reserved lands, one of only 17 in the state within the Maine Natural Resources Program, hosting 5 of the State of Maine's public campsites.

On the southern end of the lake sits the Chesuncook Dam Village which holds the Chesuncook Lake Boom House Museum honoring the logging history of the area, and hosting over 600 visitors yearly, a commercial fishing and hunting business, many private cottages and is the take-out point for the famous West Branch canoe trip as well as the launching point for lake adventures. Multiple private camps dot the shoreline between the north and south shores.

Numerous private camps line the west shore of Caribou Lake and join a large neighborhood of private camps on the east shore. On a summer day one will see recreationists canoeing, kayaking, motor boating and fishing. Winter brings adventurers snowmobiling, ice fishing and Nordic skiing. The lakes are always alive with those savoring the beauty and recreational opportunities the lakes offer.

The previous licensee understood the recreational value and use of the lakes north of Ripogenus Dam and managed the lakes in a balanced manner with an average drawdown "during the recreation season from 1972 to 1985 was 3.45 ft. The maximum drawdown of the impoundment during the recreation season for the period of record was 15.25 ft in 1980, an extreme low water year when the impoundment began the season 11.4 ft below the normal high-water elevation."

There is also immense economic value to the lakes. A recent study by the University of Maine reveals Maine lake's economic value at a staggering 14 billion. The Bureau of Economic Analysis found Maine is the third most heavily involved state in the recreation industry. The report credits Maine's world-class outdoor recreational assets and predicts Maine's outdoor companies who are innovative and sustainable have "great potential for future growth." A study of outdoor recreation in rural Maine found a potential for doubling the industry in the next ten years, from $2.3 billion in 2017 to $5.6 billion in 2030. Outdoor research also shows that access to the outdoors is a major element in recruiting talent." Outdoor recreation encompassed 4% of the state gross domestic product in 2022. As explained by Jenny Kordick, the executive director of Maine Outdoor Brands, "Outdoor recreation isn't just a pastime; it's the heartbeat of our state's economy." The Piscataquis County Economic Development Council believes in the potential of the region as well and identifies Chesuncook Lake as "one of Maine's recreational highlights."

The recreational value of Chesuncook, Caribou and Ripogenus lakes cannot be overstated. The Maine Department of Agriculture, Conservation and Forestry, in a 2004 policy on FERC hydropower project licensing, directed the Bureau of Parks and Lands "engagement to be focused on 1) public recreational facilities and access, 2) adequacy of flow releases for boating, and 3) the effect of the project on public lands. The primary concern of the Bureau is to avoid or reduce the adverse impacts of continued, increased or fluctuating impoundment levels and downstream flows on public access, wildlife habitat,

forest resources, aesthetic resources, recreational facilities, and public trust rights on these lands." These lakes matter to the people of the state of Maine. As one of the user survey respondents stated, "I love any recreational experience I have on Chesuncook Lake. It is an invaluable natural resource to the state of Maine because of its remoteness and beauty. I have been coming to Chesuncook Lake many times a year for the past twenty years, and it's a lake I plan to return to for the rest of my life. It's one of my favorite places in Maine to motorboat, kayak, canoe, paddleboard, and swim in the summer."

The images that follow demonstrate the impact of project operations on recreationists, boaters, fishermen and those using remote camping sites cared for by the Maine Bureau of Parks and Lands that were not captured in the study reports. Additional images were included with Caribou, Chesuncook Lake Camp Associations/Chesuncook Dam Camp Owners Association USR Comments.

The access between Chesuncook and Caribou Lakes at near full lake and at low water. Look closely at the second picture where you will see a canoe trying to navigate the narrow channel. The canoeists eventually had to walk their boat. Motorboats could not pass.





Mouser Island, one of the most heavily used BPL sites on the lake, at high water and at low water. The rocky shoreline makes walking extremely dangerous and limits access.





Below the lake, the flow diversion at Ripogenus Dam regularly diverts nearly all flows from the West Branch of the Penobscot River, virtually dewatering the Ripogenus Dryway or Upper Gorge of the natural river channel other than an unnatural steady state minimum flow of 100 cfs from July 1 to September 30. At other times, GLHA leaves the Upper Gorge dewatered except for leakage of 12 cfs.

The minimum flow in the bypassed reach is 0.07 cubic feet per second per square mile (cfsm) of the drainage area during the summer months and 0.008 cfsm during the rest of the year, far below the United State Fish and Wildlife Service recommended base flow of 0.5 cfsm necessary to support healthy aquatic habitat. The flow diversion and dewatering of the natural river channel below the Ripogenus Dam impacts aquatic habitat, obstructs river connectivity, reduces sediment transport, degrades water quality, reduces recreation opportunity, and degrades the aesthetic quality of the Ripogenus Dryway.

From the top of the Ripogenus impoundment to the McKay Station tailrace, the dewatered natural river reach drops about 84 feet over the .75-mile natural river channel. While the licensee does not include a description of the geologic features in the bypassed reach, imagery of and accounts by whitewater paddlers of this reach shows that this river reach contains a continuous series of ledges and features that provide high-quality whitewater boating opportunity when sufficient flows are provided. Additionally, the licensee acknowledged in its prior license application that the Upper Gorge is an aesthetic feature in the project boundary that draws visitors to the project to hike and view the falls in its present dewatered condition. There are no scheduled whitewater boating releases in the Dryway, and the licensee does not provide information on the frequency with which flows are spilled into the natural river reach when the pond is full, and inflows exceed the 3500 cfs combined capacity of the three turbines at McKay Station. McKay Station is a 38.6 MW powerhouse that operates in hydropeaking mode by fluctuating the upstream impoundment. Given the allowable impoundment drawdown of 44 feet at Ripogenus and the licensee’s interest in avoiding spillage, we assume that spillage into the Upper Gorge is infrequent outside of the spring freshet.

Due to the flow diversion at Ripogenus Dam, flows into the Upper Gorge section above McKay Station dramatically alter the natural flow regime by fluctuating flows from a near non-existant from of 12 cfs to 100 cfs for most of the year, and then periodically spill high flows in excess of 10,000 cfsin the spring. Compare flows into the Upper Gorge to the outflows from McKay Station where flows from inflows and storage typically range from 1,000 cfs to 3,500 cfs unless the project is spilling flows into the bypassed reach. These flow fluctuations into the Upper Gorge eliminates valuable recreational boating and fishing opportunities, damages aquatic habitat, and degrades aesthetic views. While a hiking trail between Ripogenus Dam and McKay Station provides some recreation opportunity, access into the water in the Upper Gorge is difficult due to the lack of a defined portage route around the dam down to the water. The lack of adequate flows, access, and real-time flow information in the Upper Gorge limits recreational boating, fishing, and aesthetic viewing opportunities. Additionally, generator trip events that drop flows to 400 cfs for an average duration of four hours have been occurring on an average of once per year that two independent stranding studies have shown cause to cause extensive downstream mortality to fish, especially landlocked salmon fry and parr.

Under its current license, GLHA is required to release flows from McKay Station from pond storage ranging from 1,800 to 2,300 cfs daily between 8:30 a.m. and 5:00 p.m. from May 1 to October 15.

Flows fluctuate based on the day of the week, time of year, and water year type. GLHA flows may exceed these minimums based on station generation needs or spill. GLHA's required daytime generation flows during the recreation season has provided significant whitewater boating opportunities that support the outdoor recreation economy in the region.

Whitewater flows have proven to be fish-friendly flows and this combined with GNP's need for steady flows resulted in a world-class landlocked salmon fishery below McKay Station that was recognized as such in the EIS published in 1996. Over the years, peaking operations and Brookfield's removal of Ripogenus dam keeper have increased the time needed to restore flows after a generator trip event affecting both salmonids directly and the macro-invertebrate community upon which they feed. Poor water management and lake drawdowns has impacted the smelt population in the lake and decreased the resultant drift downstream hurting size quality. The overall result is a diminished fishery.

Below McKay Station, project outflows cascade over the 15-mile premier whitewater boating reach between McKay and Debsconeag before flowing into Ambajejus Lake in the North Twin Development impoundment and diversion dam located 21 miles below McKay Station. Like McKay, North Twin is a peaking operation relying on storage from the four lakes that comprise its impoundment. North Twin impoundment lake levels fluctuate throughout the year from 1.5 feet after spring refill to 3.5 feet during the late summer to 12 feet or more during the winter months. Flows into the North Twin Impoundment come from releases from Ripogenus and tributary inflow as well as water pumped from the Millinocket Lake Storage Development.

Flows into North Twin are augmented by the Millinocket Lake Storage Development pumping water into Ambejejus Lake in support of hydropeaking operations at North Twin. Impoundment levels at Millinocket Lake Storage Development fluctuate 10 feet because of its pumping for North Twin Station as well as the release of an unnatural steady state minimum flow of 60 cfs from Millinocket Lake Dam into the 9.4-mile reach of Millinocket Stream between Millinocket Lake and Shad Pond below the Millinocket Development. The pumping at Millinocket Lake diverts flows that would otherwise be available for downstream flows on Millinocket Stream, eliminates natural flow variability beneficial to aquatic habitat and recreation, degrades water quality, and increases the hydropeaking on the West Branch of the Penobscot in the Penobscot Mills project area.

The North Twin Dam, located 33 miles below the Ripogenus Dam, is a 7 MW hydropower development with three turbines with a combined hydraulic capacity of 4500 cfs. The powerhouse, located adjacent to the North Twin Dam, operates in hydropeaking mode fluctuating flows from a minimum flow of 2000/3000 cfs up to the 4500 cfs hydraulic capacity of the project. Project outflows are released into a riverine reach leading to Quakish Lake, the impoundment for the Millinocket Development located 2.6 miles below the North Twin Dam.

Inasmuch as Quakish Lake has negligible storage capacity, the licensee's characterization of its operations at Millinocket and the lower developments as run-of-river is misleading in several respects. The Penobscot Mills Hydroelectric Project is a hydropeaking project from North Twin to East Millinocket because each hydropower development is successively passing peaking flows from the upstream development. None of these developments can be characterized as run-of river because they generate power based on the flow regime at North Twin and rely on the operational flexibility provided by the North Twin and Millinocket Lake storage reservoirs. Characterizing the Millinocket

Development as run-of-river obscures the substantial impact of project operations by implying that it passes natural flows and protects the natural flow regime.

More significantly, the 37 MW Millinocket Development dams and diverts the West Branch of the Penobscot River at Stone Dam where the current license requirements fail to mandate any minimum or naturally variable flow into the 4.5-mile natural river channel of the Penobscot River leading to Shad Pond, a section of the Penobscot River that the licensee incongruously calls the "Back Channel", a characterization objectionable to the Penobscot Indian Nation and numerous stakeholders. While the Licensee is required to release a minimum flow of 3,000 cfs from North Twin Development from August 22 through October 15 and 2,000 cfs from Shad Pond at other times, no minimum or naturally variable flows are passed at Stone Dam, leaving the natural river channel nearly dewatered at most times. The only flow in the natural river is from tributary inflow in the lower reach when available and at times when upstream flows exceed the 4,305 cfs hydraulic capacity of the Millinocket powerhouse, primarily during the spring runoff.

Flows from Millinocket Development, Millinocket Lake Storage Development, and leakage or spill from Stone Dam converge on Shad Pond downstream from Millinocket Development with a required minimum flow of 2,000 cfs leading to the Dolby impoundment. Like Millinocket, the licensee mischaracterizes the Dolby Development as run-of-river. In reality, the Millinocket, Dolby, and East Millinocket Developments, like Ripogenus and North Twin, are utilize hydropeaking flows from the upstream projects that successively pass altered flows rather than passing unaltered flow or reregulating discharges to more closely mimic the natural flow regime.

The Dolby Development, located approximately 8 miles below the Millinocket Development and approximately two miles above East Millinocket Development, has a 16.5 MW powerhouse with a hydraulic capacity of 4,350 cfs. Both Dolby and East Millinocket have negligible usable storage. Flows from the Dolby tailrace flow into the West Branch of the Penobscot River to the East Millinocket Development located 1.9 miles downriver. The Drainage area at East Millinocket is 2,111 sq. mi.. East Millinocket powerhouse has a combined hydraulic capacity of 4,200 cfs. The Penobscot Mills project flows into the Medway project, also owned by GLHA, before reaching the mainstem of the Penobscot River.

## Impact of Project Facilities & Operations on Resources

### Aquatic Habitat & Fish Passage

For more than a century, the dams on the mainstem and tributaries of the Penobscot River have decimated native species of sea-run fish including Atlantic Salmon and Shad. While efforts over the past two decades have resulted in the removal of the Veazie and Great Works dams, improvements to fish passage, and opening of hundreds of miles of habitat, the continued presence of hydropower dams continue to have deleterious effects on numerous fish species and recreation opportunity. The harm caused by the hydropower dams on the Penobscot is evident in the licensee's dams at East Millinocket, Dolby, Millinocket, North Twin, and Ripogenus. Once home to Atlantic Salmon, river herring, and other native fish species, what remains today is a managed fishery with landlocked Salmon, smelt, and warm water fish species.

Restoration of the Penobscot River will require an assessment of each dam along the mainstem and tributaries to provide meaningful improvements for fish passage through the relicensing process.

Fish passage at the Penobscot Mills and Ripogenus hydroelectric projects is virtually nonexistent except for North Twin where passage is provided for landlocked Salmon between the Millinocket and North Twin impoundments. The dewatering of bypassed reaches below the Ripogenus and Millinocket dams has eliminated habitat that would be otherwise suitable for various species. The East Millinocket and Dolby projects lack any fish passage for river herring and there are no Shad in Shad Pond. Restoration of the river reach from the Ripogenus impoundment to the East Millinocket tailrace will require the restoration of flows to dewatered river reaches, installation of appropriate fish passage at each development, and the restoration of a Shad fishery in Shad Pond. Restoration of flows on the West Branch below Stone Dam would provide 4.5 miles of suitable habitat that is presently dewatered by the licensee.

The reach below from McKay Station to below Nesowadnehunk Falls is known for its wild landlocked salmon fishery. While Atlantic salmon are known to have proceeded upstream past Ripogenus Falls top Penobscot Stream, this reach is not designated Atlantic salmon critical habitat. Emphasis should be on optimizing the anadromous fish passage in the Penobscot Mills Project and optimizing the habitat for landlocked salmon in the Ripogenus Project. Anadromous fish passage in the Penobscot Mills Project will improve the overall health of the watershed and benefit Atlantic salmon restoration efforts in the mainstem of the Penobscot. The Penobscot Nation holds treaty-reserved sustenance fishing rights in the Penobscot River that would be served. Tribe has advocated for the installation of full depth angled trash racks with a dedicated downstream bypass to protect downstream migrants (primarily eels and brook trout). It is well established that Atlantic salmon cannot be successfully restored without restoring their co-evolved species, on the West Branch, American eels, American shad and river herring.

**Whitewater Boating**

The West Branch of the Penobscot River is known internationally as among the most important rivers for whitewater boating in the Northeast and draws tens of thousands of whitewater boaters annually seeking to enjoy the scenic beauty of the West Branch of the Penobscot River and its dramatic rapids. Paddlers traveling to the Maine Woods region have a positive economic impact on the region and support the outdoor recreation economy, impacts that far exceeds the value of power generated by these hydroelectric projects.

The West Branch of the Penobscot River, where the projects are located, is treasured by local residents and visitors to the area who enjoy boating, angling, swimming and hiking throughout the recreation season. Eco-tourism and outdoor recreation form the foundation of the local economy, relying heavily on the resources impacted by these projects. Unfortunately, project facilities and operations diminish recreation opportunities on the West Branch of the Penobscot River, and diminish the natural beauty of the area, obstructing natural river flow, dewatering dramatic waterfalls, rapids and other sections of the natural river essential to the enjoyment of designated and existing uses of these rivers. American Whitewater and Appalachian Mountain Club have identified four sections of the West Branch of the Penobscot River located in the project boundaries for the Ripogenus and Penobscot Mills projects as providing high quality whitewater boating opportunities. These sections are as follows:

- **Ripogenus Dryway:**

The section of the West Branch from Ripogenus Dam to McKay Station, known as the Upper Gorge or Ripogenus Dryway, is a .75-mile reach with sufficient gradient structure to provide a highly valuable whitewater boating opportunity with sufficient flow. This section of the West Branch cascades over a series of ledges and other geologic features through a remote, narrow gorge setting before paddlers enter the lower gorge below McKay Station. This section has been periodically run by paddlers during spillage from the Ripogenus Dam, demonstrating that this section should be considered a whitewater boating resource. Unfortunately, opportunities to boat this section are infrequent as they only occur when flows are above station capacity, or when the project is offline. The aesthetic quality of this reach also attracts hikers along the Upper Gorge Trail. While precise flow ranges for this section of the river are unknown, anectodical information from those who have previously boated this reach shows that the Ripogenus Dryway is boatable at flows at 400-2200+ cfs and provides flows in the Class III/IV range of difficulty. These flows within the normal operating range of the project and would require that the licensee forego generation and restore natural river flows in Upper Ripogenus Gorge.

The reach is watered by100 cfs flows from July 1 to September 30. These flows come from a sluiceway which provides the warmest water from Ripogenus-Chesuncook-Caribou Lake, and do not function as fishing flows as intended. The warmwater attracts fallfish, not salmonids. An IFIM fisheries habitat study conducted during the last relicensing shows that flows in the Upper Gorge would provide a fishery there.

Here is what the applicable Maine statutes say:

> MRSA §467¶7C(1)c: From Ripogenus Dam through Ripogenus Gorge to the McKay powerhouse - Class B.
> MRSA §465¶3A: “3. A. Class B waters must be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; navigation; and as habitat for fish and other aquatic life. The habitat must be characterized as unimpaired. [PL 2003, c. 227, §3 (AMD); PL 2003, c. 227, §9 (AFF); PL 2005, c. 561, §10 (AFF).]”
> MRSA §466(11): ‘"Unimpaired" means without a diminished capacity to support aquatic life.’

Dewatering the gorge for nine months out of the year is contrary to Maine environmental law, the habitat cannot be considered unimpaired. Minimum flows to the dryway must be provided year-round to provide aquatic habitat as required by Maine statutes.



*Ripogenus Dryway at high flow*



*Ripogenus Dryway at base flow conditions*



*Ripogenus Dryway from the crest of Ripogenus Dam*



*Ripogenus Dryway during a high flow event showing whitewater paddling features*

- **McKay Station:**

The West Branch of the Penobscot River below McKay Station is the arguably the most renowned whitewater river in the northeast, its closest comparable river reach being the Gauley River in West Virginia. The upper section below McKay features a series of Class III – V rapids through the Penobscot Gorge and Cribworks sections to Big Eddy. This section of the West Branch is known for its powerful hydraulics, waterfall drops, stunning views of Mount Katahdin and frequent wildlife sightings. The 15-mile reach down to Debsconeag provides both rafters and private boaters with an unequaled boating opportunity in the region.

Under its current FERC license, the licensee is required to release daytime flows ranging from 1800-2300 between May 1 – October 1 with flows varying within this range depending on the day of week and hydrologic conditions. While this flow range is well utilized by both private boaters and commercial outfitters, the licensee has not conducted a controlled-flow whitewater boating study on this river reach using the widely accepted *Whittaker* protocols developed in 2005 to identify minimum acceptable and optimal flow ranges.



*Penobscot Gorge downstream of McKay Station*



*Cribworks Rapid on the West Branch of the Penobscot River near Telos Road*



*Rapids on the West Branch of the Penobscot River*

- **Stone Dam:**

The Penobscot Mills Dryway or Stone Dam Dryway between Stone Dam and Shad Pond on the West Branch of the Penobscot River, is a 4.5-mile river reach that the licensee refers to as the "Back Channel", which has the potential to provide a highly valuable whitewater boating opportunity to paddlers with a wide range of abilities if sufficient flows were provided. Under current FERC license conditions, the licensee is not required to release any minimum flow into this lengthy river reach as all flows are diverted into the Millinocket powerhouse rather than flowing naturally into the river.

The flow diversion at Stone Dam and the dewatering of the 4.5-mile reach of the West Branch of the Penobscot River destroys aquatic habitat, obstructs sediment transport, reduces water quality, and eliminates valuable recreational boating and angling opportunities that would otherwise be available if sufficient flow were provided. This section of the river contains ample gradient and geologic features that would provide high quality aquatic habitat as well as whitewater boating and angling opportunities under appropriate flow conditions. The reach also contains Grand Falls, a significant geologic feature located 2.7 miles below Stone Dam. Rarely, flows are spilled over Stone Dam when upstream flows from North Twin exceed 4305 cfs and the impoundment is at capacity. Dewatered throughout the year except during high flows that are beyond the capacity of the project to store or generate power, the dewatered Grand Falls is a natural and recreational treasure along this reach significantly impacted by the projects.

Higher flows into the West Branch at Stone Dam can be released from an inflatable rubber flashboard system and is currently operated at times by deflating the pneumatic rubber flashboard system to provide flows of 200 cfs and then ramping up at an interval of 400 cfs an hour until downstream flow targets are met or until Stone Dam falls to 459.45 FTMSL.

This section of the West Branch has been run by numerous whitewater boaters when flows on the West Branch exceed the hydraulic capacity of the Millinocket Development. While this river reach is clearly boatable, minimum acceptable and optimal flow ranges are unknown, and the licensee has not previously performed a controlled-flow whitewater boating study using the widely accepted *Whittaker* protocols developed in 2005. Boaters previously paddling this reach have determined that this reach contains Class III/IV rapids that provide a high-quality whitewater boating experience under suitable flow conditions. as shown on the image that follows.




*West Branch of the Penobscot River Below Stone Dam Showing Spillage*




*West Branch of the Penobscot River Below Stone Dam at Grand Falls Showing Spillage (Occasional)*




*West Branch of the Penobscot River Below Stone Dam at Grand Falls Dewatered (Typical)*



*Grand Falls on the West Branch of the Penobscot River below Stone Dam on the Penobscot Mills Dryway (Unknown flow)*

Current operations affecting operation of Stone Dam are contrary to Maine Statutes.

MRSA §467¶7C(1)f: From the outlet of Ferguson and Quakish Lakes to its confluence with Millinocket Stream - Class C.

MSR Title 38 §465(4). "4. Class C waters. Class C shall be the 4th highest classification.

A. Class C waters must be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; navigation; and as a habitat for fish and other aquatic life.

B. Class C waters must be of sufficient quality to support all species of fish indigenous to those waters and to maintain the structure and function of the resident biological community…"

C. Discharges to Class C waters may cause some changes to aquatic life, except that the receiving waters must be of sufficient quality to support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community."

Watering the reach is needed to meet Maine statutory requirements for designated uses other than hydroelectric production: fishing, recreation and habitat.

Watering the reach would be compliant with the EPA's April 2024 ruling regarding access to resources in ceded Native American lands. "The U.S. Environmental Protection Agency (EPA) is finalizing revisions to the Clean Water Act (CWA) water quality standards (WQS) regulation to add requirements for states establishing WQS in waters where Tribes hold and assert rights to CWA-protected aquatic and aquatic-dependent resources reserved through treaties, statutes, or Executive orders." [A Rule by the Environmental Protection Agency on 05/02/2024. Citation: 89 FR 35717]

Improvements to whitewater, recreation and aesthetics must be accompanied by minimum flows to support aquatic habitat.

- **Millinocket Stream:**

Millinocket Stream between Millinocket Lake and Shad Pond has the potential to provide whitewater boating opportunity if sufficient flows are provided. While there is no river gage and the licensee does not publicly release flow information on spill from the Millinocket Lake Dam, whitewater boating is an existing use on this 9.4-mile river reach during spill conditions.

In its prior relicensing of the Penobscot Mills Hydroelectric Project, the licensee acknowledged the whitewater boating potential of this reach in response to FERC's AIR, stating that the reach between Millinocket Lake and Shad Pond is a recreational resource when flows greater than 250 cfs are released from the Millinocket Lake Dam including the Class III Locomotive Rips (or Choo-Choo Falls). While the information was solely based on a conversation with several boaters who previously paddled the reach, a more in-depth study is required to evaluate the recreational value of the resource more thoroughly.

Since the last relicensing, boaters have paddled Millinocket Stream below the dam when flows are available, and for the past 3 years, local boaters have hosted the Millinocket X-treme Canoe Race demonstrating substantial interest in this reach as discussed below.

**Relicensing Studies**

In response to stakeholder study requests, FERC issued a Study Plan Determination on May 13, 2022, as modified by the Study Modification Determination on July 23, 2023, requiring that GLHA conduct a number of studies that impact recreational use, habitat restoration, aesthetics, and other non-power values. Stakeholders previously filed comments in response to the Initial Study Report and Updated Study Report and incorporate those comments by reference and summarize them below. Inasmuch as GLHA has not completed all required studies or responded to all additional information requests by FERC and stakeholders, we reserve the right to file additional comments, and if necessary additional study modification requests, once those studies are complete and additional information has been provided. Studies conducted to date have failed to inform the full range of options for future project operations that will best balance project harms and benefits in this complex and highly modified river segment.

- **Historic Operations Data Assessment Study**

As more fully explained in AW/AMC Initial Study Report Comments, the Ripogenus and Penobscot Mills hydroelectric projects were last licensed in 1996. At the time of the last relicensing, the project provided power to the Millinocket and East Millinocket paper mills. Those paper mills closed in 2008 and 2013, respectively, and the projects were converted to provide power to the electric grid in 2014. Although the project purpose changed in 2014 following the closure of the paper mills, the Water Management Plan, including the required minimum flows to the West Branch Penobscot bypassed reaches and Millinocket Stream, is based on the project purpose of supplying power to the paper mills at the time of the last relicensing. The study does not address historical changes in the timing of generation since the closure of the paper mills and the repurposing of the project.

The Ripogenus Dam impounds the West Branch creating a 710,000-acre-foot impoundment that fluctuates by 44 feet and causing negative impacts to Ripogenus Lake, Caribou Lake, Chesuncook Lake, Moose Pond, Brandy Pond, and Black Pond. Project operations at Ripogenus divert flows into a penstock bypassing the natural river channel, leaving .75 miles of the West Branch dewatered except for an unnatural minimum flow of 12-100 cfs when flows are less than the 3500 cfs hydraulic capacity of McKay Station. Under its current license, the licensee is required to release minimum flows at McKay Station ranging from 1000-2300 cfs at different times of day and at different times of year that support power generation, aquatic habitat below McKay Station, and whitewater boating and other recreation.

Project operations at McKay alter flows by impounding and gradually releasing flows on the West Branch. Project operations at McKay adversely affect water quality by raising water temperature and lowering dissolved oxygen in the impounded lakes, reducing sediment transport, harming the littoral zone, and limiting stream access upstream from the dam. Downstream from the dam, the natural river channel between Ripogenus Dam and McKay Station is adversely

affected by the inadequate minimum flow and by the loss of naturally variable flows that have an adverse effect on aquatic habitat and whitewater boating use in the Upper Gorge. An examination of historical flow data demonstrates the infrequency of spill below Ripogenus Dam when the impoundment is full and inflows exceed the 3,500 cfs McKay Station hydraulic capacity.

Spill below Ripogenus Dam is infrequent even during even the highest water years and is generally limited to the high flows that typically occur at tail end of the spring freshet when the impoundment fills after the annual winter drawdown. The licensee manages the project to maximize generation by lowering the reservoir elevation during the winter to avoid spill — what the study report euphemistically and offensively calls “waste flow”, but which are actually the restored natural flows to the West Branch of the Penobscot River. This artificial lowering of the impoundment reduces the number of boatable days in the Upper Gorge and beneficial effects of high flows on aquatic habitat.

Millinocket Lake Storage serves as one of several impoundments for the Millinocket Development with a fluctuating impoundment affecting upstream and downstream aquatic habitat. Flows on Millinocket Stream are diverted by Millinocket Lake Dam and then pumped to Ambajejus Lake joining inflows from the Ripogenus Project into North Twin. The pumping station was constructed in 1950 to provide additional water for generation of power for the paper mills. With the demise of the paper mills, the flow diversion and partial dewatering of Millinocket Stream provides power to the grid and profit to the licensee. Lake Millinocket and Millinocket Station essentially function similar to Ripogenus in that flows are diverted by Millinocket Lake Dam through a series of impoundments before flowing into the Millinocket Station tailrace and back into Millinocket Stream.

The effect of this diversion is the partial dewatering of Millinocket Stream leaving only a minimum flow of 60 cfs or less to support aquatic habitat. The flow diversion at Millinocket Dam disrupts river connectivity due to the lack of fish passage, obstructs sediment transport and water quality, and reduces flow variability. The licensee operates two pumps with a combined hydraulic capacity of 244 cfs to pump water from Millinocket Lake to Ambajejus Lake. The pumps typically operate from 16-63 percent of the time throughout the year, with near continuous pumping typically occurring throughout much of the warmer summer months in all water year types, often reducing outflows from 300 cfs down to a meager 60 cfs for much of the year. Since there is no gage on Millinocket Stream, the flow data is based on a calculated flow, so the accuracy of this data cannot be verified.

The Millinocket Development also functions as a typical hydropower project with Stone Dam impounding the West Branch of the Penobscot River, a bypassed reach on the West Branch of the Penobscot River below Stone Dam, and a powerhouse at Millinocket Station discharging diverted flows into Shad Pond before rejoining the West Branch. Under the current FERC license, the bypassed reach of the West Branch has been completely dewatered by the Stone Dam other than minimal leakage or infrequent spillage over the flashboards.

The 1996 FERC license disregarded the environmental consequences of the complete dewatering of the West Branch below Stone Dam based on the economic impact to the paper mills owned by

the then licensee, Great Northern Paper. The dewatering of the West Branch below Stone Dam can no longer be justified by the economic impact on Great Northern Paper whose paper mills no longer operate, their crumbling structures marring what would otherwise be a pristine landscape. The dewatering below Stone Dam has disrupted river connectivity, destroyed aquatic habitat, eliminated recreation opportunities, and degraded cultural resources.

- **Operations Model**

FERC's Study Plan Determination required that GLHA complete an Operations Model Study to evaluate alternative modes of operation against a baseline scenario to evaluate the impact of alternatives on water availability, power generation, aquatic resources, recreation, and other values. At the request of AW/AMC, GLHA invited stakeholders to submit various scenarios, and GLHA agreed to some but not all of the requested model runs. The model runs requested by AW/AMC were intended to simulate the following scenarios:

- Minimum flow in Upper Gorge
- Whitewater boating releases in Upper Gorge
- Minimum flow below Stone Dam
- Whitewater boating releases below Stone Dam
- Elimination of pumping at Millinocket Lake Storage
- Whitewater boating releases in Millinocket Stream

GLHA agreed to all of the model runs requested by AW/AMC with the exception of the 400 cfs minimum flow in the bypassed reach below Ripogenus Dam. Inasmuch as GLHA agreed to the 200 cfs model run requested by USFWS and the results are relatively linear, the effect of the 400 cfs minimum bypassed reach flow in the Upper Gorge can be easily extrapolated from the model run results. Below are the results of those model runs:

| No. | Scenario Name | Requestor(s) | Project Area | Summary of Alternative Scenario Evaluated by the Model** | Summary of Modeling Results Compared to BaselineR3 | Effect of Scenario on Average Annual Generation Compared to BaselineR3 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | RIP | NTWIN | MILL | DOLBY | EMILL |
| 9 | 1000RecUpperGorge | AW/AMC | Ripogenus Bypass Flow (Upper Gorge) | • 5/1-10/1, provide 1,000 for 4 hours on 1 weekend day each week from 10:00-14:00. | • Requested scenario has minimal effects on Ripogenus impoundment elevations, timing of flows, and generation at McKay Station based on the approximately 330-acre-feet of water per release event. | 0% | 0% | 0% | 0% | 0% |
| 10 | 200UpperGorge | USFWS | | • 24/7/365, provide 200 cfs in the Ripogenus bypass reach | • Requested scenario results in slightly lower Ripogenus Impoundment elevations, as model strives to efficiently utilize McKay Station to pass downstream flows while maintaining 200 cfs in bypassed reach.<br>• Increased outflows from Ripogenus at times results in a slight increase in spill occurring at downstream developments. | -6.9% | 1.0% | 0.4% | -0.2% | -0.1% |
| 11 | 200StoneDam | USFWS MDEP MDIFW | Millinocket Bypass Flow (below Stone Dam) | • 24/7/365, provide 200 cfs from Stone Dam. | • Requested scenario results in an increase in the number days of spill at Dolby dam as compared to BaselineR3 due to the difference in timing and magnitude of releases from the Millinocket powerhouse and dam. | 0% | 0% | -4.9% | 0% | 0% |
| 12 | 400StoneDam | AW/AMC | | • 24/7/365, provide 400 cfs from Stone Dam. | • Requested scenario results in a small decrease in Millinocket Impoundment elevations as compared to BaselineR3 due to the difference in timing and magnitude of releases from Millinocket powerhouse and dam.<br>• Requested scenario results in an increase in the number days of spill at Dolby and East Millinocket dams as compared to BaselineR3 due to the difference in timing and magnitude of releases from the Millinocket powerhouse and dam. | 0% | 0% | -10.0% | -0.1% | 0% |
| 13 | 2300RecStoneDam | AW/AMC | | • 5/1 – 10/1, provide 2300 cfs from Stone Dam for 4 hours on 1 weekend day each week from 10:00-14:00. | • Requested scenario results in an increase in the number days of spill at Dolby and East Millinocket dams as compared to BaselineR3 due to the difference in timing and magnitude of releases from Millinocket powerhouse and dam. | 0% | 0% | -0.6% | 0% | -0.1% |
| 14 | NoMillLakePumping | AW/AMC | Millinocket Stream Flow | • No Pumping from Millinocket Lake Storage to North Twin. | • Requested scenario results in slightly lower North Twin Impoundment elevations and flows.<br>• Requested scenario results in slightly higher Millinocket Lake Impoundment elevations.<br>• Requested scenario results in very small differences in impoundment elevations and flows downstream of North Twin as compared to BaselineR3 due to the difference in timing and magnitude of releases from Millinocket Lake. | 0.1% | -1.6% | -1.2% | -0.1% | -0.1% |
| 15 | 600RecMillStream | AW/AMC | | • 6/1 – 10/1, provide 600 cfs from dam for 4 hrs on 1 weekend day each week for WW boating from 10:00-14:00 | • Requested scenario results in very small differences in impoundment elevations and flows as compared to BaselineR3. | 0% | 0% | 0% | 0% | 0% |

**The information in the table represents the conditions that were evaluated by the model, which may slightly differ from what was requested as indicated in the May 3, 2024 filing with FERC included as Attachment A of this report.

The results of all model runs requested by AW/AMC (including the 200 cfs bypassed reach model run requested by USFWS) demonstrate the viability of each of the AW/AMC requested scenarios. Specifically, the model runs demonstrate the following:

- Providing 1000 cfs whitewater releases from Ripogenus Dam into the Upper Gorge one weekend day each week for four hours from May 1 to October 1 will have no effect on annual generation.
- Providing 200 cfs bypassed reach flow in the Upper Gorge, rather than the current 12/100 bypassed reach flow, will result in a 2.6% reduction in total generation reduction at Ripogenus and Penobscot Mills.
- Providing 400 cfs bypassed reach flow below Stone Dam, rather than the current no bypassed reach flow (leakage 12/121 cfs), will result in a 3% reduction in total generation reduction at Ripogenus and Penobscot Mills. Unclear whether this accounts for leakage flows.
- Providing 2300 cfs whitewater releases from Stone Dam into the West Branch bypassed reach one weekend day each week for four hours from May 1 to October 1 will have a 0.2% effect on annual generation. This effect would be reduced in the likely event that a minimum flow from Stone Dam into the West Branch is required under a new project license.
- Eliminating pumping from Millinocket Lake Storage into North Twin impoundment will result in a 0.5% reduction in total generation reduction at Ripogenus and Penobscot Mills.
- Providing 600 cfs whitewater releases from Millinocket Lake Storage Dam into Millinocket Stream one weekend day each week for four hours from May 1 to October 1 will have no effect on annual generation.

Overall, these operations model runs demonstrate that providing scheduled whitewater boating releases in the Upper Gorge and Millinocket Stream will have no effect on generation at the projects, and that providing scheduled whitewater boating releases below Stone Dam will have a negligible effect on generation. The Level 1 whitewater boating study on these three reaches and comments by numerous stakeholders demonstrates that the Upper Gorge, Stone Dam, and Millinocket Stream river reaches are highly desirable by a wide range of recreational users and would provide more natural river functions when paired with appropriate minimum and variable flows. Additionally, eliminating pumping operations from Millinocket Lake and ending the flow diversion into North Twin will have minimal effect on generation and would restore flows and natural river function to Millinocket Stream.

In addition, AW; AMC; TU; Caribou, Chesuncook Lake Camp Associations; Chesuncook Dam Camp Owners Association; the Allagash Gateway Campground; and Andre Emerson Cushing Corporation submitted a joint request for ops model runs that would accommodate additional requirements. Brookfield rejected this request. These organizations will next focus on agreeing on sets of ops model runs that will be submitted in the near term. This will include scenarios outside the limits that Brookfield has dictated for the model runs.

A key issue regarding the Ops Model remains the fill elevation for the lake. Even though a Brookfield representative stated at the USR Meeting that Brookfield had filled Ripogenus-Chesuncook Lake to over 939 asl this spring, Brookfield refuses to conduct Ops Model runs above that elevation. Brookfield's own data shows that it has filled the lake to above that level often in the past: Operations data from 2010-2022 shows lake elevation on May 15th at 940 asl or above every year except 2012, 2013, 2015, 2016 and 2021. Given these data, the upper limit should be 941.6 asl, the physical, but safe limits created by Ripogenus Dam. By failing to run the Ops Model at a more realistic and historically accurate fill regime, Brookfield is misleading the available fill volumes, making less profitable flow scenarios seem less feasible than they truly

are. Stated another way, if Brookfield raised the lake fill level, it could offset or at least mitigate the economic impacts of increased minimum flows required for other purposes. This 2.6 feet of elevation equates to billions of cubic feet of water with enormous potential use, not just for power generation but to provide flows to maintain lake levels allowing access to boat ramps in Ripogenus-Chesuncook Lake and flow into Ripogenus Gorge to create both whitewater and recreational fishing opportunities as well as improve the aquatic habitat. It is well established that Brookfield uses even smaller amounts of water level variance elsewhere in Maine in its many run-of river projects to conduct peaking operations, varying flows to maximize the profitability of its electricity, but degrading both the aquatic habitat and recreational fishing opportunities in the process. Efficient management of lake fill levels can mitigate this degradation.

- **Recreation**

As more fully explained in the AW/AMC Initial Study Report and Updated Study Report Comments, GLHA conducted a recreation study as required by FERC's Study Plan Determination and Study Modification Determination evaluating both formal and informal recreation sites. While the study report collected useful data on formal and informal recreation sites, the report's conclusions that all recreation sites are in good condition and its failure to make recommendations for improvement is unsupported by the study results. The deficiencies in the study report are particularly egregious at the whitewater boating access sites where the need for improvements is apparent. In the Upper Gorge, for example, there is no marked or improved trail leading down to the river that would enable whitewater boaters, as well as anglers and hikers, to easily descend the steep embankment to boat this river reach when sufficient flows are present, enable access tranquil fishing spots, or enjoy aesthetic views of the Upper Gorge.

At McKay Station, the rafting put-in needs improvement to provide safe river access. Additionally, there is no sanitation at the lower access area where rafters are dropped off as the only portable sanitation unit is locked. There is no signage directing rafters to summit the steep access road to locate the toilets at the upper parking area. The access road to the lower drop off location is available only to commercial outfitters but not to other boaters.

At Stone Dam, there is no clearly marked parking area across Quakish Lake, there is no easy egress at Stone Dam, and no land access to Stone Dam is provided by GLHA. These areas are all used during spill events when flows are restored to these river reaches; however, the difficult access and lack of real-time flow information inhibit recreational use. To assess project effects on this recreation opportunity, the licensee needs to expand the geographic scope of the study to include informal recreation access areas identified by stakeholders.

In performing its NEPA analysis of project effects, we encourage FERC to carefully examine the study data in the recreation and whitewater boating study reports and stakeholder comments rather than GLHA's unsupported conclusions about the adequacy of formal and informal recreation sites. Given that GLHA has declined to prepare a Recreation Management Plan, we request that FERC develop appropriate PM&E measures that address project effects on recreational resources including adequate parking and river access. We also recommend that this study be read in conjunction with the operations model study, angler flow study, whitewater boating study, and the USGS gage study as these studies and potentially others are intended to

address project effects on recreational resources. These measures should include flow and impoundment level notification, safety signage, parking, sanitation, recreation flow releases, and improvements to access in impoundments, bypassed reaches in the Upper Gorge, Stone Dam, and Millinocket Stream, and riverine reaches affected by project operations.

- **Whitewater Boating**

At the request of AW/AMC and following FERC's Study Plan Determination, GLHA conducted a whitewater boating study to assess project effects on whitewater boating opportunities on four river reaches in the project boundary: 1) Upper Gorge between Ripogenus Dam and McKay Station; 2) Below McKay Station to Debsconeag; 3) Millinocket Stream below Millinocket Lake Dam; and, 4) West Branch between Stone Dam and Shad Pond. The intent of the study is to assess potential whitewater boating opportunities and to identify the acceptable and optimal flow ranges for whitewater boating by individuals currently or potentially utilizing these river reaches under current or alternative modes of operation, evaluate the adequacy of put-in and take-out locations and the need for access improvements, and identify flow information needs that would support whitewater boating use. FERC-approved whitewater boating studies routinely follow the standard methodology as described in Whittaker et al., in "*Flows and Recreation: A guide to studies for river professionals"* (2005). This methodology is designed to assess the presence, quality, and preferred flow ranges for river-based boating resources in a stepwise manner. The process steps are generally 1) desktop analyses, 2) on-land feasibility assessment, and/or on-water single flow assessment, 3) on-water multiple flow assessment.

While AW/AMC requested that GLHA follow the full study methodology with appropriate off ramps before proceeding to the next stage, GLHA initially conducted only a Level 1 desktop analysis on each of the four river reaches identified by American Whitewater. The Level 1 component of the study was sufficient for the McKay Station and Millinocket Stream in that it confirmed that these two-river reaches provide valuable whitewater boating opportunities when sufficient flows are present.

The reach below McKay Station has long been considered the premier whitewater boating run in New England containing scenic gorges and powerful hydraulics that provide thrilling rafting and kayaking opportunities throughout the summer. While this region in Maine was once known for its paper mills that were the mainstay of the local economy, today the region is known for its outdoor recreation that drives the local economy. Rafting the West Branch below McKay Station draws tourists from throughout the country and beyond to experience the scenic views and rapids below the powerhouse. Whitewater boating flows from McKay Station are required under GLHA's current license and range from 1800 to 2300 cfs depending on the water year type and day of the week throughout the boating season. Whitewater boating below McKay Station results in no loss of generation.

In addition to the reach below McKay Station, Millinocket Stream below Millinocket Lake Dam has the potential to offer whitewater boating opportunities of a very different character. Over the past three years, the annual Millinocket X-Stream Canoe Race has been held on this section of the river. The race is a 7.3-mile whitewater race for canoes, kayaks, and paddle boards on the Millinocket Stream in Maine. This section is appropriate for both novice and intermediate

boaters. The annual event has drawn up to 100 participants and demonstrated considerable paddler and spectator interest. Opportunities to boat on Millinocket Stream are extremely limited due the GLHA's current operations that divert flows into Millinocket Lake into North Twin impoundment through pumping operations that leave Millinocket Stream without sufficient flows for boating throughout most of the year. The primary obstacles to recreational boating at Millinocket Stream are the lack of boatable minimum flows, pumping operations, the lack of real-time flow information, and the lack of scheduled boating releases required under the current license.

While the Level 1 analysis at McKay Station and Millinocket Stream was sufficient to identify minimum acceptable and optimal flow ranges and no further study was necessary on these two river reaches, insufficient information was obtained on the potential whitewater boating opportunities in the Upper Gorge and on the West Branch below Stone Dam and further study following the Whittaker methodology is warranted. While the Level 1 study was insufficient, it did provide limited information demonstrating the whitewater boating potential of the Upper Gorge and Stone dam sections.

Flows below Ripogenus Dam into the Upper Gorge dryway are infrequent due to GLHA's flow diversion at Ripogenus into the penstock for power generation. Local paddlers have boated this reach infrequently when inflows exceed the hydraulic capacity of McKay Station and impoundment storage is at maximum capacity. While there is no flow gage in the bypassed reach and GLHA does not report bypassed reach flows on the Safe Waters website, local boaters have reported that this reach contains highly valuable whitewater boating opportunities at a variety of flow levels.

At lower flows, perhaps 600 cfs by some reports, this reach provides intermediate boating above McKay Station. At higher flows, perhaps 1000 cfs and above, rapids become more challenging as hydraulics become more powerful. At a range of flow levels, paddlers have reported that paddling the Upper Gorge is important because it considerably lengthens the whitewater boating run through the Ripogenus Gorge below McKay Station by adding as many as six additional rapids to the run providing more appealing recreation opportunities for advanced and expert paddlers. Current minimum flows of 12 to 100 cfs are insufficient to provide whitewater boating opportunities in the Upper Gorge dryway. The primary obstacles to use of this river reach are the flow diversion, lack of boatable minimum flows, lack of scheduled releases, and the inadequacy of access from the Ripogenus hiking trail down to the river.

As with the Upper Gorge, the section of the West Branch below Stone Dam is a hidden whitewater boating resource that is largely dewatered by the Penobscot Mills project. With no required minimum flow below Stone Dam under the current license, the only flows present in this dewatered river reach come from leakage from flashboards, spill when inflows into Quakish Lake exceed the hydraulic capacity of the Millinocket Development, or backflow from Shad Pond. There is no real-time flow gage on the West Branch below Stone Dam and this information is not reported on the Safe Waters website. Access is also a major impediment to use as GLHA does not allow public access though its easement and accessing Stone Dam via Quakish Lake involves a 2-mile flat water paddle. Access may also be available to lands on the river right over lands controlled by Katahdin Forest Management.

Over the years, this section of the West Branch has been paddled by whitewater boaters at various flows, but not enough is known about minimum and optimal boating levels. At very high flows, this run provides a continuous series of Class III/IV rapids as the river approaches Grand Falls, a Class IV rapid with challenging hydraulics suitable for intermediate and advanced paddlers. At lower flow levels, the run is suitable for intermediate paddlers. At the request of American Whitewater, FERC required GLHA to proceed with the Level 2 study phase including an on-water flow evaluation. As described in more detail in our Updated Study Report comments, GLHA has the capacity to release variable flows from its inflatable gate structure including flows of 2000 cfs to meet minimum downstream flow requirements when the Millinocket powerhouse trips offline. Through the Level 2 study phase, we intend to evaluated the boating potential of this river reach at this flow level and reserve the right to supplement our comments when the final study report is completed.

- **Aesthetics**

GLHA was required to perform an aesthetics study to evaluate project effects on aesthetic view opportunities at both projects. Regrettably, this study was conducted in a way that poorly informs FERC NEPA analysis. Rather than evaluate the aesthetic effect of impoundment fluctuations, flow diversions, and peaking operations, GLHA randomly photographed lakes and omitted views that highlight degraded aesthetic view and then evaluated those views using its own paid consultant, and later, asked stakeholders to review those same photographs. In a subsequent phase, it allowed a study group to view these locations in person at additional locations, but the result was more of an anecdotal opinion survey rather than a systematic assessment of aesthetic impact of project operations. Missing from this study is an evaluation of shoreline aesthetics at minimum and maximum impoundment levels, as well as views of the Upper Gorge at various levels from both Ripogenus Dam and the lower Ripogenus Gorge. Comments filed by numerous stakeholder and comments at the scoping and study report meetings attest to the negative impact of project operations at impoundments and dewatered river reaches at the projects.

## Compliance Issues

July 7, 2023 McKay Station Trip Event. FERC Compliance has not resolved the complaint regarding the event. No interim solution has been identified. Video obtained during the Ramping Study on July 14 and 24, 2024 shows that additional mortality can occur even when flows are reduced to 1000 cfs in the vicinity of the McKay Station hydro discharge.

Millinocket Stream Stocking. Recent stockings have violated the Penobscot Mill Project License, Article 413 that requires brook trout, three to a pound, be stocked in May. Additionally, larger brook trout are stocked in mid-October after local fishing interest has diminished. If this can't be corrected, other more effective mitigation should be discussed."

Holbrook Bypass flows. Flows provided during generator trip events violate Article 406 of the current license. The bypass was designed to provide flows when main river flows are in the 2400

cfs range. The bypass was designed to support the landlocked salmon population by providing needed juvenile recruits. When flows decrease, the bypass is no longer suitable landlocked salmon rearing habitat. The habitat has largely been taken over by brook trout juveniles. "We simply request that the Licensee continue to operate and maintain the Holbrook Side Channel as outlined in the current license, Order approving recommendations of habitat improvement plan under Article 406." [MDIFW PAD Comments October 8, 2021, page 12]. The bypass was a mitigation measure included in the current license, higher base flows restore this mitigation measure.

**FERC Process**

The Signatories request that an Environmental Impact Statement (EIS) be required for these relicensings in lieu of an Environmental Analysis (EA). This is necessary because of the size and complexity of the projects, and has the potential to highlight deficiencies in project studies.

**Preliminary NGO Request for New License Terms and Conditions**

The Signatories submit their list of desired features for incorporation into the new license as Attachment A.

**Conclusion**

The signatories appreciate the opportunity to submit these comments on the Draft License Application for the Ripogenus – Penobscot Mills relicensing.

Respectfully submitted on August 1, 2024,

American Whitewater
Bob Nasdor
Northeast Stewardship & Legal Director

Conservation Law Foundation
Sean Mahoney
Vice President, Maine Advocacy Center

Appalachian Mountain Club
Mark Zakutansky
Director of Conservation Policy Engagement

Allagash Gateway Campground
Andre Emerson Cushing Corporation
Benjamin Worrell
Legal Council

Chesuncook Lake Camp Association
Chesuncook Dam Camp Association
Bill Houston
Designated Representative

American Whitewater
Andrew Fisk
Director, Northeast Region

Maine Council of Trout Unlimited
Stephen G. Heinz
Maine TU Council FERC Coordinator

American Rivers
Andrew Fisk, Ph.D.
Northeast Regional Director

Atlantic Salmon Federation
John R.J. Burrows
Vice President, U.S. Operations

Chris Howe

Maine Rivers
Charles Owen Verrill, Jr., Esq.
President, Board of Directors

Ed Spear

**Attachment:**

Preliminary Stakeholders Requests for Inclusion in Ripogenus and Penobscot Mills License

# ATTACHMENT

# Preliminary Stakeholders Requests for Inclusion in the Ripogenus and Penobscot Mills Licenses

**Ripogenus-Chesuncook Lake**

1. Fill the lake to 940.6 (1 foot below full pond) by May 15th, drawdown no more than 1 foot every 28 days until July 31.

Justification:

a. Meets loon habitat and nesting requirements
b. Provides for smelt spawning and incubation
c. Promotes shorebird nesting
d. Potential protection of wood turtle reproductive sites
e. Maintains and stabilizes the littoral zone (plankton and juvenile smelt)
f. Provides water for summer recreation needs
g. Parallels MEDEP and MDIFW Operations Model requests
h. Provides water for summer recreation, fisheries and generation needs
i. Mirrors current plan for other project lakes
j. Meets or restores ME DEP water quality standards
k. Supported by GLHA Water Use Plan in current license

2. Maximum 1 foot lake drawdown per month from July 31-October 15, maintaining a minimum lake level of 935.6 on October 15

Justification:

a. Supported as possible (within 1 foot) by Ops Model run with minimal downstream impact
b. This was accomplished in 2013, a dry/average hydrologic year, while still generating 238,835 mw
c. Boat landings remain usable
d. Provides for the gradual drawdown cited in DLA and other GLHA submissions
e. Maintains aesthetic value of lakes
f. Provides safe lake access
g. Ensures remote campsites are safely accessible and aesthetically pleasing
h. Provides salmonid access to tributary streams
i. Provides improved angler access to the Upper West Branch (September)
j. This will provide habitat conditions at the confluence of Umbazookus Stream suitable for Lake Whitefish spawning activities: staging, spawning, and post spawning out migration. Allagash Stream offers nearby adult Lake White fish as a donor source therefore, a small undetected relic population may exist, and this elevation provides an opportunity for natural recolonization.

k. Reduces navigation hazards
l. Meets or restores ME DEP water quality standards
m. Supported by GLHA Water Use Plan in current license

3. Set the operating (when power is being generated) minimum at McKay Station flow at 2400 cfs during the biological growing season (May1 -October 15) and at 2200 cfs from October 16-april 30th

Justification:

a. Similar to how operated under Great Northern Paper and supported by the 1996 Flow Management Plan
b. The water is available if McKay Station operations are modified.
c. Meets Maine Department Water Quality Standards
d. Stabilize aquatic macroinvertebrate populations
e. Stabilize habitats for various fish populations
f. Restore fishing opportunity to its historic levels (1978-1991)

4. Provide river flows capable of meeting required Holbrook Bypass channel (article 406) flows or reengineer the Bypass gate system to meet the required flow during low flow events.

Justification:

a. The Bypass was designed to provide flows when main river flows are in the 2400 cfs range.
b. Support the Landlocked salmon population by providing needed juvenile recruits
c. When flows decrease, the Bypass is no longer suitable landlocked salmon rearing habitat. The habitat has largely been taken over by brook trout juveniles.
d. "We simply request that the Licensee continue to operate and maintain the Holbrook Side Channel as outlined in the current license, Order approving recommendations of habitat improvement plan under Article 406." [MDIFW PAD Comments October 8, 2021, page 12]
e. The bypass was a mitigation measure included in the current license, higher base flow restores this mitigation.

5. Water Upper Ripogenus Gorge year-round at higher than leakage flows with minimum flows of 350 cfs. From June 15 to September 15, this must be from a deep gate, not the sluiceway. These flows would be subtractive from summer whitewater flow requirements. Example: 2400 cfs would be supplied by 2050 cfs from McKay Station, 350 cfs from a deep gate release.

Justification:

a. Higher, year-round flows support fishing and aesthetics
b. Provides new whitewater paddling and buffers generator trip events
c. Water over the sluiceway currently provided is the warmest in the lake and does not provide the fishing flows the release was designed to provide. An IFIM from last relicensings shows the fisheries value. [Need quote, cite] 350 cfs has been requested by the whitewater community.

d. Current sluiceway 100 cfs sluiceway flows from July 1 to September 30 are attractive to fallfish, not the salmonids that are sought after recreationally. The 100 cfs does not achieve its design purpose.

e. Current dewatering practices (9 months out of the year) are contrary to Maine environmental law, the habitat cannot be considered unimpaired.

1. MRSA §467¶7C(1)c: From Ripogenus Dam through Ripogenus Gorge to the McKay powerhouse - Class B.
2. MRSA §465¶3A: "3. A. Class B waters must be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; navigation; and as habitat for fish and other aquatic life. The habitat must be characterized as unimpaired. [PL 2003, c. 227, §3 (AMD); PL 2003, c. 227, §9 (AFF); PL 2005, c. 561, §10 (AFF).]"
3. MRSA §466(11): "Unimpaired" means without a diminished capacity to support aquatic life."

f. 350 cfs minimum flows in Ripogenus Gorge would satisfy Maine statutory requirements for designated uses other than hydroelectric production: fishing, recreation and habitat.

6. Whitewater releases for Rip Gorge from 5/1-10/1, flows 1000 cfs, 1 weekend day weekly, 4 hours

Justification:

a. Ripogenus Gorge contains sufficient gradient and structure resulting in a continuous series of rapids between Ripogenus Dam and McKay Station suitable for intermediate to advances whitewater boaters

b. This reach is suitable at a range of flow levels with flows between 600 cfs to 1000+ having been identified as optimal.

c. Substantially extends the length of whitewater boating reach that would otherwise begin at McKay Station.

d. Operations Model indicates this is possible with little to no impact on project generation.

e. Whitewater boating study and comments by public indicate that there is substantial demand for boating in the Ripogenus Gorge dryway.

7. Require mid-winter assessment and reporting of snowpack, long and short-term weather forecasts, and impoundment levels to determine if operations modifications (e.g. reduced outflow) are necessary to secure water for spring refill.

Justification:

a. With greater energy demands predicted for the winter months (ISONE Report to Maine Legislature, Jan, 2023) this needs to be done to support spring refill.

8. USGS gauge installed to record and report levels and flows - located between Little and Big Eddy Pool. Include a temperature gage as is usually installed at a USGS flow gage site.

Justification:

a. The updated Study Report (USR) contains information in Appendix B.
b. Exact location would be determined by further study.
c. Implementation would be relatively easy to accomplish.
d. This is the new license provision with the highest likelihood of adoption.

9. Lake level elevations for all sites (including storage ponds) reported on Safe Waters.

Justification:

a. Lake boaters need to know this information for safe navigation and to be able to anticipate the condition of the boat landings, and other access.
b. Relatively easy to accomplish
c. This is public information that is currently available for North Twin and Millinocket Lakes

10. Set minimum flows for trip events and other conditions based on empirical data.

Justification:

a. There is no study data to support minimum flows in the current license and minimum safe flows are unknown> 1422 cfs is the aquatic base flow based on a rough guideline, 1300 cfs is unsupported by data, 1000 cfs is a round number, 400 or 500 cfs has been demonstrated to strand and kill fish and macro-invertebrates.
b. TU repeatedly requested flows below 1000 cfs during the Ramping Study that Brookfield refused to provide
c. Reports from ramping Study volunteer observers were that even at flows of nominal 1000 cfs in the reach below Little Ambejackmockamus Falls known to be a major spawning area, some gravels were exposed and others were covered only by 2 to 3 inches of water.
d. Ramping Study volunteers reported stranded, dewatered caddis larvae with minimum mobility that were exposed during nominal 1000 cfs flows
e. Without further study, biologically appropriate minimum flows must be assumed to be aquatic base flows of 1422 cfs per longstanding USFWS guidance for the Northeastern United States [USFWS Interim Regional Policy for New England Stream Flow Recommendations, dated May 11, 1999].

11. Adopt conditions that restrict peaking TDB maintain 1800 to 2400 cfs flows during the growing period, May 1 to October 15.

Justification:

a. MDIWF request: [MDIFW PAD Comments October 8, 2021, page 12] “As the literature is replete with examples of the detrimental impacts on the riverine fisheries and aquatic communities from rapid changes in flow, and that the literature indicates that flow changes of less than 25% per hour (ramping rate) can mitigate impacts from peaking power, we request flow records to evaluate the frequency of flow changes that exceed 25%.”

b. Reduce caddis mortality, especially Hydropsyche and Rhyacophila.

c. Reduce strandings shown to occur when switching between one, two or three generator operations.

d. Improved flow stability benefiting overall health of the system.

12. Decrease the number and severity of “flow excursions” through automated flow restoration at Rip/McKay and/or restore dam keeper

Justification:

a. Generator trip events that were demonstrated to strand and kill fish and macro-invertebrates. happen on the average of once a year and last for over 4 hours according to Brookfield’s own data. This is unacceptable.

b. Automated Rip deep gates or reinstalling a dam keeper would result in reducing down time and provided for Brookfield’s stated concerns for safety in Ripogenus Gorge.

c. Brookfield’s stated concerns for safety in the Ripogenus Gorge are unsupported by logic or study data. They are only designed to keep from having to water Ripogenus Gorge.

13. Develop an operational Ripogenus project “Rule Curve” based on 1972 to -present mass inflow data and a full pond elevation of 941.6 feet. This will provide lake level guidance and should include a drought or "low water" year plan.

Justification:

a. Currently, Chesuncook, Caribou and Ripogenus lakes water is the “go to” source of water during drought years, causing profound drawdowns and associated negative impacts

b. Low water modifications need to be spread across all user groups

c. As with above requests, items 1-3, this will protect fisheries, aquatic communities, commercial, private and public recreational users and public recreational sites.

d. Rule curve will help secure year-round water storage

e. Used successfully by Great Northern Paper from 1972-2002 and accepted by FERC in the 1996 Environment Impact Statement.

14. Restore whitefish to Ripogenus - Chesuncook Lake

Justification:

a. Whitefish present in last relicensing.

b. Whitefish not sampled in latest assemblage studies.

c. Project operations a major factor in extirpation. Varying lake levels are the most likely cause.

**Penobscot Mills**

1.Reduce minimum flows from North Twin from 2000 cfs to 1500 cfs

Justification:

a. Maintain upstream lake levels and all associated benefits.
b. Only lowers North Twin .7 feet during the recreational season according to the Ops Model.
c. Adequate for downstream requirements.
d. Provides additional flexibility for releases upstream.
e. Need for downstream dilution no longer exists.

2. Water the West Branch below Quakish Lake / Stone Dam year-round with more than leakage flows of 700 to 1000 cfs minimum flow.

Justification:

a. This would maintain macroinvertebrates and landlocked salmon fishery of all life stages, not just brook trout and juveniles.
b. This could provide a new year-round fishery
c. Brookfield's aquatic habitat study shows that higher flows would support adult salmon and brook trout fisheries
d. This would provide new paddling and whitewater opportunities
e. Current operations are contrary to Maine Statutes

MRSA §467¶7C(1)f: From the outlet of Ferguson and Quakish Lakes to its confluence with Millinocket Stream - Class C.

MSR Title 38 §465(4). "4. Class C waters. Class C shall be the 4th highest classification.

A. Class C waters must be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; navigation; and as a habitat for fish and other aquatic life.

B. Class C waters must be of sufficient quality to support all species of fish indigenous to those waters and to maintain the structure and function of the resident biological community…"

C. Discharges to Class C waters may cause some changes to aquatic life, except that the receiving waters must be of sufficient quality to support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community."

f. This would need Maine statutory requirements for designated uses other than hydroelectric production: fishing, recreation and habitat
g. Watering the reach would be compliant with the EPA's April 2024 ruling regarding access to resources in ceded Native American lands. "The U.S. Environmental Protection Agency (EPA) is finalizing revisions to the Clean Water Act (CWA) water quality standards (WQS) regulation to add requirements for states establishing WQS in waters where Tribes hold and assert rights to CWA-protected aquatic and aquatic-dependent resources reserved through treaties, statutes, or Executive orders." [A Rule by the Environmental Protection Agency on 05/02/2024. Citation: 89 FR 35717]

h. Watering the main channel instead of diverting the water to the Millinocket Project would not affect downstream minimum flow requirements.

i. The only objection to higher flows is that the water would no longer be used for generation, and Brookfield's profits would suffer.

3. Establish fish passage for indigenous anadromous species over their former range, upstream extent: Shad Pond and Millinocket Stream and eel passage in Penobscot Mills System. River herring include alewives and blueback herring.

Justification:

a. These waters are within the historical range of anadromous fish.

b. The Penobscot Indian Nation was promised a sustenance fishery in the Penobscot that has yet to be delivered. This would be a step in restoring the fishery.

c. Restoration of anadromous species would improve the overall health of the watershed.

d. Restoration would aid Atlantic salmon restoration in the greater watershed, especially in the critical Atlantic salmon habitat that is downstream.

e. NGOs should support MDMR requests

f. "Put shad back in Shad Pond."

g. MDIFW has expressed concerns that this would introduce invasive species. A sorting facility could prevent this problem.

h. Denying fish passage to indigenous species is contrary to Maine statute as interpreted by the courts;

S.D. Warren Company v. Board of Environmental Protection, 2005 ME 27, 868 A.2d 210 (2005) ("S.D. Warren I"); S.D. Warren Company v. Board of Environmental Protection, 547 US 370 (2006) ("S.D. Warren II"). In S.D. Warren I at 442, the Court concluded that the narrative criteria at 38 M.R.S.A. § 465, which requires waters "of sufficient quality to support all indigenous fish species," was intended to be an integral part of the water quality standards for the BEP to consider. The Court also concluded, based upon the specificity of the designated uses at 38 M.R.S.A. § 465, that the Legislature's purpose for the language "suitable for the designated uses" was "that the designated uses actually be present." The court also stated that when those uses are not presently being achieved, the Legislature intended the quality of the water be enhanced so that the uses are achieved (internal citations omitted).

4. Provide whitewater releases into the West Branch below Stone Dam 1 weekend day weekly at 2300 cfs for 4 hours from 5/1-10/1.

Justification:

a. The West Branch between Stone Dam and Shad Pond contains sufficient gradient and structure to provide high quality whitewater boating opportunities with sufficient flows.

b. Continuous Class II/III rapids at suitable flows.

c. Grand Falls is a significant Class III/IV whitewater boating feature.

d. Aesthetic views of the West Branch below Stone Dam from the water are exceptional.

e. Whitewater boating opportunities are available at a range of flows above 1000 cfs with optimal flows being estimated as above 2000 cfs. Boating study is ongoing.

f. GLHA has the ability to release at least 2000 cfs through its inflatable gate structure that provides pond level control according to its LIHI application.
g. Operations Model indicates this is possible with little impact on generation.

5. Provide whitewater releases into Millinocket Stream on 1 weekend day weekly at 600 cfs for 4 hours from 5/1-10/1.

Justification:

a. Scenic Class II river reach below Millinocket Lake and Millinocket
b. Current 60 cfs minimum flow inadequate for boating
c. Annual Millinocket X-Treme Canoe Race demonstrates strong recreation demand
d. 600 cfs provides optimal flow for novice boaters
e. Water from Millinocket Lake pumped to North Twin for generation, reducing flows available for recreation on Millinocket Lake.
f. No effect on generation based on Operations Model.

6. Ceasing pumping at Millinocket Lake 5/1 - 10/1

Justification:

a. No pumping from Millinocket Lake into North Twin during summer boating season.
b. Pumping would still occur during higher flow period (e.g., spring freshet).
c. Pumping allowed when the project would otherwise spill utilizing excess water.
d. Little effect on generation.
e. Reserve water in Millinocket Lake for recreational use in Millinocket Stream during the recreational boating season.

**General Project Requests to Enhance Recreation**

1. Add lands to project boundary

Justification:

a. Recreation sites and recreation access related to project effects and operations should be included in the project boundary, which may include, but not limited to:
b. Vehicle access, including parking, to the Penobscot River at Stone Dam
c. Vehicle access, including parking, to the Millinocket Lake outlet
d. The public should be allowed to visit and enjoy these areas and to access the Penobscot River below Stone Dam and Millinocket Stream below Millinocket Lake for whitewater paddling, fishing, and other purposes.
e. Since flows are controlled by the licensee into these river reaches, the licensee should be required to provide public access.

2. Protect/maintain parking for fishing access sites along the Golden Road and below Telos Bridge

Justification:

a. The Golden Road is being allowed to change to gravel from paved road.
b. Plowing is obscuring pull offs for parking to access popular fishing spots.
c. Photos taken July 25, 2024 graphically illustrate the problem
d. There is a growing safety hazard from logging trucks.
e. A mechanism needs to be in place to protect parking over the 40-year span of the new license.

3. Improve Gorge Trail improvements to include new signage of parking areas, a kiosk, map of the trail showing scenic overlooks, length and slope, as well as showing trail access to the river. The trail needs more regular maintenance to clear back overgrowth, remove blowdowns, and fix drainage issues. Side trails need to be developed and added to connect to water level creating a trail network for public use.

Justification:

a. Assess will be needed to access improved fishing and paddling opportunities that minimum flows in Ripogenus Gorge will provide.
b. Aesthetics study does not provide photos showing contrasting flow levels in Upper Ripogenus Gorge.
c. NGOs working with local groups and individuals to obtain photos of the gorge at various flow levels.

4. Develop a comprehensive Recreation Management Plan that includes a robust maintenance schedule for all recreation sites, in collaboration with stakeholders, including but not limited to:

- Significant increases in the size of parking lots at launch sites at the project lakes. Almost every survey and focus group identifying parking as far too limited at boat ramps and launch sites.
- Rebuild boat launches that are too steep and not meeting user expectations such as Dead Man's Curve, and McKay Station which is both an extremely long walk for private boaters and on very uneven terrain.
- Correct deficiencies with boat launch docks noted by some users.
- Consistent kiosks, signage and maps at all recreation sites that shows all natural and recreational features that a user map encounter, as well as public safety information.
- A winter recreation specific map, focused on snowmobile, cross-country skiing and other winter activities that frequently use project boat launches for access to frozen lakes. Develop and coordinate with the greater Millinocket winter trail network to establish a comprehensive winter recreation plan.
- Providing real-time data of lake elevation levels for motorized and non-motorized users.
- Add new public access as a FERC approved recreation site to the Stone Dam site, perhaps along the existing GHLA road at the toe of Stone Dam from the east or through the Wildlife Management Area.
- Add new public access as a FERC approved recreation site at the outlet of Millinocket Lake to Millinocket Stream, perhaps along the existing road from the west used by GHLA to access the outlet.

- Add additional public access sites to the Wildlife Management area providing for more clear information and access for public use of these 2,300 acres for hunting, fishing, hiking, camping, dispersed recreation, and environmental education of the wildlife management activities taking place. A specific property management plan for this site, in concert with wildlife managers, should be developed to allow for increased and robust public uses for recreation while maintaining habitat values.

Justification:

a. The trails, recreation sites, and boat launches need to be monitored and maintained to ensure best access and experience, and maintenance plans should be developed and included in a comprehensive recreation management plan.

b. Trails, recreation sites, and boat launches are lacking basic amenities that the public demands, such as sufficient parking, docks, kiosks with recreation maps and other information, clearly marked signage of parking areas and directional signage to recreation sites, trailblazes, and seasonally appropriate information such as winter snowmobiling route finding and points of interest in the winter that may differ from the warm seasons.

c. New public access points are needed below Stone Dam, at the Millinocket Lake outlet, and the Wildlife Management Area.

d. The Wildlife Management Area represents a very large land area in the project boundary that can be better utilized for public use and enjoyment. The access road off of Route 11 has no signage, information about recreation opportunities or wildlife management activities, and is not integrated in the growing outdoor recreation amenities offered in the greated Millinocket area. Even community generated content on sites like AllTrails and Strava shows that the public is not visiting this area. A comprehensive site management plan should be developed in concert with stakeholder to fully realize the potential of these lands and the access that they provide to the Penobscot River below Stone Dam.

e. Users consistently reported in surveys and focus groups that parking at almost all boat launch sites was inadequate and that parking lots were frequently at capacity.

f. Access at Stone Dam and at the Millinocket Lake outlet are needed for project related recreation.

g. Expand winter recreation opportunities and coordinate them with surrounding landowners.

h. Some commenters found boat launches to be too steep and hard to use.

5. Remove fencing by around project facilities, McKay Station.

Justification:

a. MDIFW requested stream access to project sites are presently blocked by fencing.

b. Fencing needs to be removed at McKay Station, North Twin and Mill One.

c. Access needs to be provided at Stone Dam and the Dolby tailrace to support fishing and paddling recreational uses.

6. Improve access to the Debsconeag Falls area to support fishing and boating.

Justification:

a. Debsconeag Falls is a solid class 4/5 rapid located just over 2 miles below the existing Nevers Corner take out for commercial rafting. It would offer an excellent addition to the whitewater currently offered in the area but is almost never used by either private boaters or the commercial industry due to the poor quality of the access road leading to it.
b. It also offers an additional strong fishing opportunity that suffers the same lack of use.
c. Improvement of the road would provide additional class 4/5 boating opportunity and increased fishing opportunity with no change in flows from the baseline.
d. Adds opportunity without system management changes.

7. Establish boating/rafting/fishing access near Abol Bridge, on river right just below the bridge, or at another suitable site in the area with suitable parking.

Justification:

a. Demand for softer adventure on the river has grown at a time when the Rafting industry as a whole has contracted.
b. Providing a suitable access or egress point at Abol Bridge would allow for better service and accommodation for the growing user group that seeks softer adventure than is currently available on the West Branch of the Penobscot

8. Provide boat (launching) access to the base of Pockwockamus Falls, an historical May-early June fishing (boat) fishing area

Justification:

a. Needed to access the resource.
b. This access is frequently used by fishermen and women and boaters seeking to avoid the more difficult whitewater above.

9. Provide access by road to the east bank of the West Branch below Stone Dam.

Justification:

a. Providing minimum flows below Stone Dam at any reasonable level will provide fishing, paddling and perhaps whitewater opportunities.
b. Currently, the west shore is accessible using logging trails.
c. There is no good access from the east shore.
d. Paddlers assess the reach by a long paddle across Quakish Lake. This will be unacceptable once the reach is watered.
e. Owner Katahdin Forest Management may be amenable to the proposal.

**Recreations facilities improvements at specific sites -** Parking, ramp, amenities at launches

1. Chesuncook Dam Boat Launch - maintain site of, and primitive nature of launch with the following improvements: remove large boulders and improve substrate of launch to the 935.1 water

level, build a wind break on the northwest side of ramp, pay for and expand winter plowing, annual maintenance of ramp to repair erosion and ice damage.

Justification:

a. Provides safe, reliable access to project waters including public campsites
b. Enhances the safety of boats and trailers being launched. Currently there is repeated damage to these.
c. Supports commercial businesses
d. Ensures safe navigation between and within project lakes
e. Protects aesthetics of lakes and campsites
f. Ops Model Study demonstrates this as possible with minimum impact

2. Caribou Lake Boat Launch - increase parking both summer and winter, annual maintenance of ramp to repair erosion and ice damage. Maintain a usable water level of 936.7 or higher, as indicated in the Recreation Study from May 15th to the end of Labor Day weekend

Justification:

a. This is the level the boat launch is usable according to the Recreational Study
b. Provides safe, reliable access to lakes
c. Ensures safe navigation of project lakes
d. Supports commercial businesses
e. Protects aesthetics of lakes and campsites

3. Ambajejus Boat Launch/Millinocket Lake Boat Launch - Provide Adequate parking

Justification:

a. Current parking is inadequate during times of peak use: weekend and holidays.
b. Restricts access to both Ambejejus and Millinocket Lakes.
c. Appears to be within the project boundary.
d. Photos will be provided documenting the problem

Christopher G Howe, KINGFIELD, ME.
DLA Comments:

First off I'd like to thank the Staff at FERC for doing what you do. Without you and this platform,
ordinary citizens like myself would be left without a voice in this highly consequential process. Without FERC, and this process, I'd greatly fear the sacrifices companies like Brookfield/GLHA would make only to enrich their shareholders value.

Secondly I'd like to voice my support of the joint submission by American Whitewater, Trout Unlimited, Appalachian
Mountain Club, and American Rivers. Also I'd also like to express my support for the comments submitted by MPRO, the consolidated voice
of the commercial rafting industry on the Penobscot, which is so very important to the community, culture, and heritage to the Katahdin Region and this project boundary. While not individually a member of MPRO, I am a member of the community they represent. I have been guiding rafts on the Penobscot River for 16 seasons and have lived on the banks of the river for 10. I have guided thousands of people from all parts of the world and walks of life down this beautiful river, and the enrichment, fulfilment, and joy our participants receive while paddling the Penobscot cannot be overstated. From families enjoying quality time without cell phones, to business team building outings, to recovering drug addicts, to groups of hardworking men seeking escape from their daily grinds to support their families, to the solo traveler who wishes to experience everything a place has to offer. Whitewater Rafting on the Penobscot is a very special experience that cannot be duplicated anywhere in the world.

In my view, The DLA presented by GLHA is just straight up disrespectful to these proceedings and to all the stakeholders, agencies, and non profit organizations who have spent valuable time, and significant resources to contribute to this re-licensing. After years of studies, bureaucratic process, and ungodly amounts of money spent, GLHA could not even so much as come up with simple side notes that reflect any of the new data or stakeholder concerns that have arisen since the start of this process. GLHA continues to play school yard games with our beautiful watershed and this process by manipulating data, and delaying meetings and studies. GLHA chooses to play these tiresome games instead of putting their nose to the grindstone, and addressing the problems of the 1996 license, and getting this thing done. At the end of the day it appears that GLHA would rather endure years of legal mitigation instead of just working with stakeholders, NGOs, and agencies to come up with a fair and balanced license that would bring justice back to Maines largest watershed. This sentiment is further exacerbated by GLHA comments to stakeholders in the USR, where they continued to ultimately deflect, minimize, and ignore stakeholders concerns.

I've had 2 experiences recently that have really struck home the magnitude and the importance of these proceedings, and that we ALL must WORK HARDER, at WORKING

TOGETHER, to come up with a fair an balanced license that benefits firstly the river, its fish, and its bugs, and secondly benefiting the diverse groups of users who frequent the project boundary.

First being involved with both of the Ramping Studies that took place in July of this summer. I personally witnessed thousands of bugs and bug larva squirm, writhe, die, and panic as the water levels receded leaving them exposed to brutally hot 90 degree heat and direct sun. The scale of this devastation was very emotional as I paddled through the Ripogenus Gorge, where merely every rock along the river was covered with these squirming and struggling bugs and larva. To add to the personal devastation at witnessing such suffering, I also witnessed 30-50 salmon and brook trout panic swimming aggressively around a small stranding pool, desperately seeking escape when no escape was not possible. All because GLHA wants to play a min/max game to squeeze every $ out of the water that is not even theirs to begin with. To think of all the fish and bugs that have suffered or have been killed because of these studies just makes me sick.

The second experience was journeying to the West Branch of the Penobscot River below Stone Dam. With completely dry feet I was able to stand directly in the main river bed below Stone Dam as maybe 5 CFS trickled through the shallow and hot disjointed pools. As I stood gazing at the empty riverbed I considered all the life that used to exist in this river reach and how such life has been denied existence because of the 1996 license. To realize that GLHA is happy and okay with this denial of life is upsetting to me on the deepest level. For GLHA/Brookfield to produce a Draft License Agreement with virtually no input of new data and stakeholder concerns, shows how uncooperative GLHA is to coming up with healthy solutions to the problems this watershed has faced since the projects inception. And to realize the motive for all this denial of life and uncooperative behavior by GLHA is greed, control, and power is at times to much to bare.

As depressing as these 2 experiences were it gave me great hope that a much better future is with in our grasp and is possible because of FERC and this process. Although, personally, I have worries about the level of corruption that has infiltrated many of our greatest federal institutions, I'm still a patriotic American who believes in our country, our process, and our agencies designed to regulate and beat back the evils of the world. My personal experiences with the FERC staff working on this issue keep that patriotic bell tolling in my heart that we can do this, and that GLHA/Brookfield, FERC, Agencies, NGO's, and Private Stakeholders CAN work together to come up with fair and balanced license that brings JUSTICE to Maines largest watershed.

Thank you for taking the time to read my comments on the DLA,

Sincerely,

A fiercely dedicated friend of the Penobscot

Chris Howe

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Great Lakes Hydro America, LLC
Application for New License

Ripogenus Hydroelectric Project
FERC No. 2572

Penobscot Mills Hydroelectric Project
FERC No. 2458

# JOINT NGO STAKEHOLDER COMMENTS ON DRAFT LICENSE APPLICATION FOR THE RIPOGENUS HYDROELECTRIC PROJECT (P-2572) AND PENOBSCOT MILLS HYDROELECTRIC PROJECT (P-2458)

American Whitewater ("AW"); Appalachian Mountain Club ("AMC"); Maine Council of Trout Unlimited ("TU"); American Rivers ("AR"); Maine Rivers; Atlantic Salmon Federation ("ASF); Caribou, Chesuncook Lake Camp Associations; Chesuncook Dam Camp Owners Association; the Allagash Gateway Campground; and Andre Emerson Cushing Corporation (collectively, "NGOs" or "Signatories") submit the following Comments in response to the filing of the Draft License Application for the Ripogenus Hydroelectric Project and Penobscot Mills Hydroelectric Project (FERC Project Nos. P-2572, P-2458) by Great Lakes Hydro America, LLC ("GLHA") Collectively, these projects are located on the West Branch of the Penobscot River and Millinocket Stream and are comprised of the Ripogenus Hydroelectric Project and the Millinocket Lake Storage, North Twin, Millinocket, Dolby, and East Millinocket developments as part of the Penobscot Mills Hydroelectric Project. While GLHA holds separate licenses for the Ripogenus and Penobscot Mills projects, the licensee has appropriately jointly filed a Draft License Application because GLHA is the licensee for both projects, they have the same license expiration date, and the operations of both projects are inextricably linked. Throughout the Integrated Licensing Process utilized for this relicensing, GLHA has held joint Initial Study Report and Updated Study Report meetings as well as joint meetings concerning ongoing studies applicable to both projects including recreation, aesthetics, and project operations. Inasmuch as these projects have cumulative impacts on both developmental and non-developmental resources, we are jointly filing these comments on the Draft License Application for both projects as a single document under each FERC docket to support a coordinated approach to the relicensing of these projects and to advocate for the preparation of a single NEPA document addressing the cumulative impact of all six developments.

American Whitewater is a national non-profit 501(c)(3) river conservation and recreation organization founded in 1954. With approximately 6,000 members and 85 affiliate clubs, representing tens of thousands of whitewater paddlers across the nation, American Whitewater's mission is to protect and restore our nation's whitewater resources and to enhance opportunities to enjoy them safely. Our members are primarily conservation-oriented kayakers and canoeists, many of whom live and/or engage in recreational boating in the New England region within easy proximity of the Penobscot River. American Whitewater has long been involved with the FERC licensed hydropower projects in the Maine, including hydropower projects located on the Penobscot, Kennebec, Rapid, and Magalloway rivers, and are party to settlement agreements that provide for whitewater boating opportunities that

partially mitigate for project impacts.

Since 1876, the Appalachian Mountain Club has promoted the protection, enjoyment, and understanding of the mountains, forests, waters, and trails of the Appalachian region. AMC is the largest conservation and recreation organization in the Northeast with more than 90,000 members, supporters, and advocates, many of whom visit the lands and waters upstream and downstream of the projects for recreation.

Maine Council of Trout Unlimited represents six local chapters with over 2,000 fisher-conservationists in Maine. The mission of the organization is to bring together diverse interests to care for and recover rivers and streams so our children can experience the joy of wild and native trout and salmon. The entire watershed of the West Branch of the Penobscot is especially important to a great many of our members who enjoy its fishing resources, including the area from McKay Station to Nesowadnehunk Falls, Ripogenus-Chesuncook-Caribou Lake, and the waters below to its confluence with the main stem of the Penobscot River that are greatly affected by the Ripogenus and Penobscot Mills projects.

American Rivers is a national non-profit organization whose mission is to protect wild rivers, restore damaged rivers, and conserve clean water for people and nature.

The Caribou and Chesuncook Lake Camp Associations represent the interests of those with property on the shores of these lakes who have been greatly affected by the severe dewatering of the Ripogenus-Chesuncook impoundment in recent years. Their interest also extends to other recreational users of the lakes including the many canoe campers, recreational boaters, fishermen and women, those who use the public campsites on the lakes as well as the aquatic and shoreline communities who make their homes there.

Maine Rivers Maine Rivers, begun in 1998 as a project of the Natural Resources Council of Maine, became an independent organization in 2003. The Maine Rivers mission is to protect, restore and enhance the health and vitality of Maine's rivers. Since the Clean Water Act was passed in 1972, the health of Maine's Rivers has improved dramatically, but there are still serious threats to our rivers – from the toxins that wash in with every rain storm, to the pollution discharged by paper mills, to water withdrawals by farmers and ski resorts. Maine Rivers recognizes that the destructive impacts that colonization and industry have on our rivers also degrade and destroy human life, and seek to find better ways to safeguard Maine's countless miles of remarkable rivers.

Atlantic Salmon Federation is an international non-governmental organization dedicated to the conservation and restoration of wild Atlantic salmon and their ecosystems. ASF represents more than 25,000 members and volunteers across North America. ASF conducts research on wild salmon throughout the North Atlantic, performs complex river restoration project, promotes conservation of critical salmon habitats, and advocates for legislation and policies that will help to protect wild Atlantic salmon. ASF's U.S. office is located in Brunswick, Maine.

Allagash Gateway is a four-season sporting camp located on Ripogenus Lake near the Chesuncook Dam Point Boat Launch. It offers a private boat launch, canoeing, campsites, lodging, guide services, and a small store. During the summer months, Allagash Gateway's clientele is primarily interested in boating and fishing the lakes that make up the Ripogenus impoundment. Operations of the campground have

been profoundly impacted over the last few years by the water levels of Ripogenus Lake and Chesuncook Lake.

Andre Emerson Cushing Corporation is the majority landowner in T3 R12 WELS. Approximately 80% of Ripogenus Lake and 20% of Chesuncook Lake are within the boundaries of T3 R12 WELS. William Cushing, a director of Andre Emerson Cushing Corporation, is a year-round resident of T3 R12 WELS, and his home is on Ripogenus Lake.

These organizations are working together to represent the interests of all stakeholders, including fish and wildlife, to the Commission in the most consistent and coherent way possible. Individual organizations may submit additional DLA Comments to supplement and support this filing.

**General Comments**

The West Branch of the Penobscot River is one of the nation's premier natural, scenic, and recreational wonders. Water flowing over many millennia has sculpted the bedrock, river channel and landscape from the Ripogenus Gorge to Millinocket into a series of remarkable geological and scenic features that make this river a unique recreational and natural resource. Ripogenus Dam causes the merging of Ripogenus Lake, Chesuncook Lake and Caribou Lake in to Maine's third largest lake that provides unique recreational and scenic opportunities. The operation of large hydroelectric power plants, dams and other associated structures degrades the public's use and enjoyment of this unique and spectacular public resource.

Since the last license was issued, Project Operations have changed significantly. Great Northern Paper (GNP) operated the projects to keep a steady flow of water going downstream to power the operation of its East Millinocket Mills. Since splitting off its hydro operations to Great Lakes Hydro America, LLC, the project has been operated using peaking flows to increase profits from the electricity generated that is now sold on the grid, and use of this practice has increased under Brookfield Renewable's ownership. The current license prescribes minimum flows that were adequate in the past to protect recreational and environmental concerns. Additional terms and conditions are needed to improve water management and balance project harms and benefits given the changes to project operations. It is clear from the record of the last relicensing that agencies and officials bent over backwards to license the projects under terms and conditions favorable to GNP. These terms and conditions are not compliant with current Maine environmental statutes or federal hydropower regulations. Example: FERC does not issue storage project licenses without specifying target fill date and level or minimum drawdown levels. Under the terms of the current license, Ripogenus-Chesuncook-Caribou Lake may be drawn down to the physical limits of Ripogenus Dam.

Since the filing of the Pre-Application Document on June 11, 2021, stakeholders in this relicensing including American Whitewater, Appalachian Mountain Club, Trout Unlimited, Penobscot Indian Nation, whitewater outfitters, lake owners, state and federal resource agencies, individual recreationists, and others have filed scores of comments on the FERC docket, requested relicensing studies, participated in study implementation, attended study report meetings, and

meaningfully and substantially participated in the relicensing process. Notwithstanding the importance of the issues and concerns raised by stakeholders throughout the relicensing process, GLHA and filed a Draft License Application that ignores the result of every study and ignores the written and oral comments provided by every relicensing stakeholder. Instead, GLHA has filed a Draft License Application that proposes no changes whatsoever in is current operations with no analysis, seemingly treating the relicensing process as a waste of time and money and little more than a check-the-box exercise and expecting FERC to simply issue a new license under the same terms and conditions. The DLA states: "GLHA proposes to continue operating the Projects as described above during mean/normal, high, and adverse/low water years." [Exhibit B, page B-11] This is despite the fact that Brookfield has yet to identify the data supporting those same flows in the license despite FERC Staff's specific request. The relicensing process demands more. So does NEPA, the Federal Power Act. And the Clean Water Act.

**Description of Project Facilities and Operations**

From the top of the Ripogenus impoundment to the East Millinocket tailrace, these storage projects and hydropower dams impact more than 40 river miles of the West Branch of the Penobscot River and more than 12 river miles of Millinocket Stream. The uppermost development, Ripogenus Hydroelectric Project, obstructs more than 20 miles of the West Branch of the Penobscot River by diverting flows at the Ripogenus Dam into a 3,850-foot-long penstock leading to the McKay Station powerhouse. The drainage area of the project is 1422 sq. mi.

Ripogenus-Chesuncook-Caribou Lake has a surface area of 26,200 acres and is Maine's third largest lake. The current license allows lake levels to vary restrained only by the physical structure of Ripogenus Dam. The lake was not filled during the years 2020 and 2021 and was finally filled during the winter of 2022 by dropping outflows to 1000 cfs and subsequently 800 cfs, well below licensed spawning flows and undoubtedly having significant negative impact on the redds of salmonids downstream.

Chesuncook is unique. It is of highest value, developed mainly on the north and south shores with future development limited, and yet is still accessible. Further demonstrating the lake's status as a valued fishing, boating and canoeing destination, Maine statute prohibits jet skis from Chesuncook, Caribou and Ripogenus lakes. These lakes are remote, wilderness gems.

Chesuncook Lake's remoteness and undeveloped nature is what makes it so important to the state of Maine. So valued that the State of Maine employs a full-time Lake Ranger, May through October to monitor and maintain the public campsites on Chesuncook Lake, including Umbazookus and Gero Island. This ranger assists the numerous public, private and commercial canoe campers, recreational boaters and fishermen and women who use the lake including Bowdoin College, Colby College, Outward Bound, the Sierra Club, the LL Bean Discovery Program, and numerous private fishing and canoe camps and outfitters.

The lake is steeped in history. The Wabanaki–Thoreau Canoe Trail, a 200-mile network of paddling and hiking routes once used by Henry David Thoreau and members of the Wabanaki Nations, passes through Chesuncook Lake. The lake also hosts the Northern Forest Canoe Trail. This 700-mile trail is

the longest water trail in the nation spanning New York to Maine on traditional routes used by Indigenous peoples, settlers and guides.

The pristine beauty of Chesuncook Lake attracts recreational users today to the remote campsites and the developments at the north and south end. At the north end of the lake lies Chesuncook Village. A bustling community with an active church and museum, and a large, quintessential, iconic lodging facility. Just across from the village, is Gero Island, a state Ecological Preserve within public reserved lands, one of only 17 in the state within the Maine Natural Resources Program, hosting 5 of the State of Maine's public campsites.

On the southern end of the lake sits the Chesuncook Dam Village which holds the Chesuncook Lake Boom House Museum honoring the logging history of the area, and hosting over 600 visitors yearly, a commercial fishing and hunting business, many private cottages and is the take-out point for the famous West Branch canoe trip as well as the launching point for lake adventures. Multiple private camps dot the shoreline between the north and south shores.

Numerous private camps line the west shore of Caribou Lake and join a large neighborhood of private camps on the east shore. On a summer day one will see recreationists canoeing, kayaking, motor boating and fishing. Winter brings adventurers snowmobiling, ice fishing and Nordic skiing. The lakes are always alive with those savoring the beauty and recreational opportunities the lakes offer.

The previous licensee understood the recreational value and use of the lakes north of Ripogenus Dam and managed the lakes in a balanced manner with an average drawdown "during the recreation season from 1972 to 1985 was 3.45 ft. The maximum drawdown of the impoundment during the recreation season for the period of record was 15.25 ft in 1980, an extreme low water year when the impoundment began the season 11.4 ft below the normal high-water elevation."

There is also immense economic value to the lakes. A recent study by the University of Maine reveals Maine lake's economic value at a staggering 14 billion. The Bureau of Economic Analysis found Maine is the third most heavily involved state in the recreation industry. The report credits Maine's world-class outdoor recreational assets and predicts Maine's outdoor companies who are innovative and sustainable have "great potential for future growth." A study of outdoor recreation in rural Maine found a potential for doubling the industry in the next ten years, from $2.3 billion in 2017 to $5.6 billion in 2030. Outdoor research also shows that access to the outdoors is a major element in recruiting talent." Outdoor recreation encompassed 4% of the state gross domestic product in 2022. As explained by Jenny Kordick, the executive director of Maine Outdoor Brands, "Outdoor recreation isn't just a pastime; it's the heartbeat of our state's economy." The Piscataquis County Economic Development Council believes in the potential of the region as well and identifies Chesuncook Lake as "one of Maine's recreational highlights."

The recreational value of Chesuncook, Caribou and Ripogenus lakes cannot be overstated. The Maine Department of Agriculture, Conservation and Forestry, in a 2004 policy on FERC hydropower project licensing, directed the Bureau of Parks and Lands "engagement to be focused on 1) public recreational facilities and access, 2) adequacy of flow releases for boating, and 3) the effect of the project on public lands. The primary concern of the Bureau is to avoid or reduce the adverse impacts of continued, increased or fluctuating impoundment levels and downstream flows on public access, wildlife habitat,

forest resources, aesthetic resources, recreational facilities, and public trust rights on these lands." These lakes matter to the people of the state of Maine. As one of the user survey respondents stated, "I love any recreational experience I have on Chesuncook Lake. It is an invaluable natural resource to the state of Maine because of its remoteness and beauty. I have been coming to Chesuncook Lake many times a year for the past twenty years, and it's a lake I plan to return to for the rest of my life. It's one of my favorite places in Maine to motorboat, kayak, canoe, paddleboard, and swim in the summer."

The images that follow demonstrate the impact of project operations on recreationists, boaters, fishermen and those using remote camping sites cared for by the Maine Bureau of Parks and Lands that were not captured in the study reports. Additional images were included with Caribou, Chesuncook Lake Camp Associations/Chesuncook Dam Camp Owners Association USR Comments.

The access between Chesuncook and Caribou Lakes at near full lake and at low water. Look closely at the second picture where you will see a canoe trying to navigate the narrow channel. The canoeists eventually had to walk their boat. Motorboats could not pass.





Mouser Island, one of the most heavily used BPL sites on the lake, at high water and at low water. The rocky shoreline makes walking extremely dangerous and limits access.





Below the lake, the flow diversion at Ripogenus Dam regularly diverts nearly all flows from the West Branch of the Penobscot River, virtually dewatering the Ripogenus Dryway or Upper Gorge of the natural river channel other than an unnatural steady state minimum flow of 100 cfs from July 1 to September 30. At other times, GLHA leaves the Upper Gorge dewatered except for leakage of 12 cfs.

The minimum flow in the bypassed reach is 0.07 cubic feet per second per square mile (cfsm) of the drainage area during the summer months and 0.008 cfsm during the rest of the year, far below the United State Fish and Wildlife Service recommended base flow of 0.5 cfsm necessary to support healthy aquatic habitat. The flow diversion and dewatering of the natural river channel below the Ripogenus Dam impacts aquatic habitat, obstructs river connectivity, reduces sediment transport, degrades water quality, reduces recreation opportunity, and degrades the aesthetic quality of the Ripogenus Dryway.

From the top of the Ripogenus impoundment to the McKay Station tailrace, the dewatered natural river reach drops about 84 feet over the .75-mile natural river channel. While the licensee does not include a description of the geologic features in the bypassed reach, imagery of and accounts by whitewater paddlers of this reach shows that this river reach contains a continuous series of ledges and features that provide high-quality whitewater boating opportunity when sufficient flows are provided. Additionally, the licensee acknowledged in its prior license application that the Upper Gorge is an aesthetic feature in the project boundary that draws visitors to the project to hike and view the falls in its present dewatered condition. There are no scheduled whitewater boating releases in the Dryway, and the licensee does not provide information on the frequency with which flows are spilled into the natural river reach when the pond is full, and inflows exceed the 3500 cfs combined capacity of the three turbines at McKay Station. McKay Station is a 38.6 MW powerhouse that operates in hydropeaking mode by fluctuating the upstream impoundment. Given the allowable impoundment drawdown of 44 feet at Ripogenus and the licensee's interest in avoiding spillage, we assume that spillage into the Upper Gorge is infrequent outside of the spring freshet.

Due to the flow diversion at Ripogenus Dam, flows into the Upper Gorge section above McKay Station dramatically alter the natural flow regime by fluctuating flows from a near non-existant from of 12 cfs to 100 cfs during part of the summer, to nearly 15,000 cfs in the spring. Compare flows into the Upper Gorge to the outflows from McKay Station where flows from inflows and storage typically range from 1,000 cfs to 3,500 cfs unless the project is spilling flows into the bypassed reach. These flow fluctuations into the Upper Gorge eliminates valuable recreational boating and fishing opportunities, damages aquatic habitat, and degrades aesthetic views. While a hiking trail between Ripogenus Dam and McKay Station provides some recreation opportunity, access into the water in the Upper Gorge is difficult due to the lack of a defined portage route around the dam down to the water. The lack of adequate flows, access, and real-time flow information in the Upper Gorge limits recreational boating, fishing, and aesthetic viewing opportunities. Additionally, generator trip events that drop flows to 400 cfs for an average duration of four hours have been occurring on an average of once per year that two independent stranding studies have shown cause to cause extensive downstream mortality to fish, especially landlocked salmon fry and parr.

Under its current license, GLHA is required to release flows from McKay Station from pond storage ranging from 1,800 to 2,300 cfs daily between 8:30 a.m. and 5:00 p.m. from May 1 to October 15. Flows fluctuate based on the day of the week and water year type. GLHA flows may exceed these

minimums based on station generation needs or spill. GLHA's required daytime generation flows during the recreation season has provided significant whitewater boating opportunities that support the outdoor recreation economy in the region.

Whitewater flows have proven to be fish-friendly flows and this combined with GNP's need for steady flows resulted in a world-class landlocked salmon fishery below McKay Station that was recognized as such in the EIS published in 1996. Over the years, peaking operations and Brookfield's removal of Ripogenus dam keeper have increased the time needed to restore flows after a generator trip event affecting both salmonids directly and the macro-invertebrate community upon which they feed. Poor water management and lake drawdowns has impacted the smelt population in the lake and decreased the resultant drift downstream hurting size quality. The overall result is a diminished fishery.

Below McKay Station, project outflows cascade over the 15-mile premier whitewater boating reach between McKay and Debsconeag before flowing into Ambajejus Lake in the North Twin Development impoundment and diversion dam located 21 miles below McKay Station. Like McKay, North Twin is a peaking operation relying on storage from the four lakes that comprise its impoundment. North Twin impoundment lake levels fluctuate throughout the year from 1.5 feet after spring refill to 3.5 feet during the late summer to 12 feet or more during the winter months. Flows into the North Twin Impoundment come from releases from Ripogenus and tributary inflow as well as water pumped from the Millinocket Lake Storage Development.

Flows into North Twin are augmented by the Millinocket Lake Storage Development pumping water into Ambejejus Lake in support of hydropeaking operations at North Twin. Impoundment levels at Millinocket Lake Storage Development fluctuate 10 feet because of its pumping for North Twin Station as well as the release of an unnatural steady state minimum flow of 60 cfs from Millinocket Lake Dam into the 9.4-mile reach of Millinocket Stream between Millinocket Lake and Shad Pond below the Millinocket Development. The pumping at Millinocket Lake diverts flows that would otherwise be available for downstream flows on Millinocket Stream, eliminates natural flow variability beneficial to aquatic habitat and recreation, degrades water quality, and increases the hydropeaking on the West Branch of the Penobscot in the Penobscot Mills project area.

The North Twin Dam, located 33 miles below the Ripogenus Dam, is a 7 MW hydropower development with three turbines with a combined hydraulic capacity of 4500 cfs. The powerhouse, located adjacent to the North Twin Dam, operates in hydropeaking mode fluctuating flows from a minimum flow of 2000 of 3000 cfs up to the 4500 cfs hydraulic capacity of the project. Project outflows are released into a riverine reach leading to Quakish Lake, the impoundment for the Millinocket Development located 2.6 miles below the North Twin Dam.

Inasmuch as Quakish Lake has negligible storage capacity, the licensee's characterization of its operations at Millinocket and the lower developments as run-of-river is misleading in several respects. The Penobscot Mills Hydroelectric Project is a hydropeaking project from North Twin to East Millinocket because each hydropower development is successively passing peaking flows from the upstream development. None of these developments can be characterized as run-of river because they generate power based on the flow regime at North Twin and rely on the operational flexibility provided by the North Twin and Millinocket Lake storage reservoirs. Characterizing the Millinocket Development as run-of-river obscures the substantial impact of project operations by implying that it

passes natural flows and protects the natural flow regime.

More significantly, the 37 MW Millinocket Development dams and diverts the West Branch of the Penobscot River at Stone Dam where the current license requirements fail to mandate any minimum or naturally variable flow into the 4.5-mile natural river channel of the Penobscot River leading to Shad Pond, a section of the Penobscot River that the licensee incongruously calls the "Back Channel", a characterization objectionable to the Penobscot Indian Nation and numerous stakeholders. While the Licensee is required to release a minimum flow of 3,000 cfs from North Twin Development from August 22 through October 15 and 2,000 cfs from Shad Pond at other times, no minimum or naturally variable flows are passed at Stone Dam, leaving the natural river channel nearly dewatered at most times. The only flow in the natural river is from tributary inflow in the lower reach when available and at times when upstream flows exceed the 4,305 cfs hydraulic capacity of the Millinocket powerhouse, primarily during the spring runoff.

Flows from Millinocket Development, Millinocket Lake Storage Development, and leakage or spill from Stone Dam converge on Shad Pond downstream from Millinocket Development with a required minimum flow of 2,000 cfs leading to the Dolby impoundment. Like Millinocket, the licensee mischaracterizes the Dolby Development as run-of-river. In reality, the Millinocket, Dolby, and East Millinocket Developments, like Ripogenus and North Twin, are hydropeaking projects that successively pass altered flows from the upstream developments rather than passing unaltered flow or reregulating discharges to more closely mimic the natural flow regime.

The Dolby Development, located approximately 8 miles below the Millinocket Development and approximately two miles above East Millinocket Development, has a 16.5 MW powerhouse with a hydraulic capacity of 4,350 cfs. Both Dolby and East Millinocket have negligible usable storage. Flows from the Dolby tailrace flow into the West Branch of the Penobscot River to the East Millinocket Development located 1.9 miles downriver. The Drainage area at East Millinocket is 2,111 sq. mi.. East Millinocket powerhouse has a combined hydraulic capacity of 4,200 cfs. The Penobscot Mills project flows into the Medway project, also owned by GLHA, before reaching the mainstem of the Penobscot River.

## Impact of Project Facilities & Operations on Resources

### Aquatic Habitat & Fish Passage

For more than a century, the dams on the mainstem and tributaries of the Penobscot River have decimated native species of sea-run fish including Atlantic Salmon and Shad. While efforts over the past two decades have resulted in the removal of the Veazie and Great Works dams, improvements to fish passage, and opening of hundreds of miles of habitat, the continued presence of hydropower dams continue to have deleterious effects on numerous fish species and recreation opportunity. The harm caused by the hydropower dams on the Penobscot is evident in the licensee's dams at East Millinocket, Dolby, Millinocket, North Twin, and Ripogenus. Once home to Atlantic Salmon, river herring, and other native fish species, what remains today is a managed fishery with landlocked Salmon, smelt, and warm water fish species.

Restoration of the Penobscot River will require an assessment of each dam along the mainstem and

tributaries to provide meaningful improvements for fish passage through the relicensing process.

Fish passage at the Penobscot Mills and Ripogenus hydroelectric projects is virtually nonexistent except for North Twin where passage is provided for landlocked Salmon between the Millinocket and North Twin impoundments. The dewatering of bypassed reaches below the Ripogenus and Millinocket dams has eliminated habitat that would be otherwise suitable for various species. The East Millinocket and Dolby projects lack any fish passage for river herring and there are no Shad in Shad Pond. Restoration of the river reach from the Ripogenus impoundment to the East Millinocket tailrace will require the restoration of flows to dewatered river reaches, installation of appropriate fish passage at each development, and the restoration of a Shad fishery in Shad Pond. Restoration of flows on the West Branch below Stone Dam would provide 4.5 miles of suitable habitat that is presently dewatered by the licensee.

The reach below from McKay Station to below Nesowadnehunk Falls is known for its wild landlocked salmon fishery. While Atlantic salmon are known to have proceeded upstream past Ripogenus Falls top Penobscot Stream, this reach is not designated Atlantic salmon critical habitat. Emphasis should be on optimizing the anadromous fish passage in the Penobscot Mills Project and optimizing the habitat for landlocked salmon in the Ripogenus Project. Anadromous fish passage in the Penobscot Mills Project will improve the overall health of the watershed and benefit Atlantic salmon restoration efforts in the mainstem of the Penobscot. The Penobscot Nation holds treaty-reserved sustenance fishing rights in the Penobscot River that would be served. Tribe has advocated for the installation of full depth angled trash racks with a dedicated downstream bypass to protect downstream migrants (primarily eels and brook trout). It is well established that Atlantic salmon cannot be successfully without restoring their co-evolved species, on the West Branch, American eels, American shad and river herring.

**Whitewater Boating**

The West Branch of the Penobscot River is known internationally as among the most important rivers for whitewater boating in the Northeast and draws tens of thousands of whitewater boaters annually seeking to enjoy the scenic beauty of the West Branch of the Penobscot River and its dramatic rapids. Paddlers traveling to the Maine Woods region have a positive economic impact on the region and support the outdoor recreation economy, impacts that far exceeds the value of power generated by these hydroelectric projects.

The West Branch of the Penobscot River, where the projects are located, is treasured by local residents and visitors to the area who enjoy boating, angling, swimming and hiking throughout the recreation season. Eco-tourism and outdoor recreation form the foundation of the local economy, relying heavily on the resources impacted by these projects. Unfortunately, project facilities and operations diminish recreation opportunities on the West Branch of the Penobscot River, and diminish the natural beauty of the area, obstructing natural river flow, dewatering dramatic waterfalls, rapids and other sections of the natural river essential to the enjoyment of designated and existing uses of these rivers. AW and AMC have identified four sections of the West Branch of the Penobscot River located in the project boundaries for the Ripogenus and Penobscot Mills projects as providing high quality whitewater boating opportunities. These sections are as follows:

**Ripogenus Dryway:**

The section of the West Branch from Ripogenus Dam to McKay Station, known as the Upper Gorge or Ripogenus Dryway, is a .75-mile reach with sufficient gradient structure to provide a highly valuable whitewater boating opportunity with sufficient flow. This section of the West Branch cascades over a series of ledges and other geologic features through a remote, narrow gorge setting before paddlers enter the lower gorge below McKay Station. This section has been periodically run by paddlers during spillage from the Ripogenus Dam, demonstrating that this section should be considered a whitewater boating resource. Unfortunately, opportunities to boat this section are infrequent as they only occur when flows are above station capacity, or when the project is offline. The aesthetic quality of this reach also attracts hikers along the Upper Gorge Trail. While precise flow ranges for this section of the river are unknown, anectodical information from those who have previously boated this reach shows that the Ripogenus Dryway is boatable at flows at 400-2200+ cfs and provides flows in the Class III/IV range of difficulty.

These flows within the normal operating range of the project and would require that the licensee forego generation and restore natural river flows in Upper Ripogenus Gorge.

The reach is watered by100 cfs flows from July 1 to September 30. These flows come from a sluiceway which provides the warmest water from Ripogenus-Chesuncook-Caribou Lake, and do not function as fishing flows as intended. The warmwater attracts fallfish, not salmonids. An IFIM fisheries habitat study conducted during the last relicensing shows that flows in the Upper Gorge would provide a fishery there.

Here is what the applicable Maine statutes say:

> MRSA §467¶7C(1)c: From Ripogenus Dam through Ripogenus Gorge to the McKay powerhouse - Class B.
> MRSA §465¶3A: “3. A. Class B waters must be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; navigation; and as habitat for fish and other aquatic life. The habitat must be characterized as unimpaired. [PL 2003, c. 227, §3 (AMD); PL 2003, c. 227, §9 (AFF); PL 2005, c. 561, §10 (AFF).]”
> MRSA §466(11): ‘"Unimpaired" means without a diminished capacity to support aquatic life.’

Dewatering the gorge for nine months out of the year is contrary to Maine environmental law, the habitat cannot be considered unimpaired. Minimum flows to the dryway must be provided year-round to provide aquatic habitat as required by Maine statutes.



*Ripogenus Dryway at high flow*



*Ripogenus Dryway at base flow conditions*



*Ripogenus Dryway from the crest of Ripogenus Dam*



*Ripogenus Dryway during a high flow event showing whitewater paddling features*

**McKay Station:**

The West Branch of the Penobscot River below McKay Station is the arguably the most renowned whitewater river in the northeast, its closest comparable river reach being the Gauley River in West Virginia. The upper section below McKay features a series of Class III – V rapids through the Penobscot Gorge and Cribworks sections to Big Eddy. This section of the West Branch is known for its powerful hydraulics, waterfall drops, stunning views of Mount Katahdin and frequent wildlife sightings. The 15-mile reach down to Debsconeag provides both rafters and private boaters with an unequaled boating opportunity in the region.

Under its current FERC license, the licensee is required to release daytime flows ranging from 1800-2300 between May 1 – October 1 with flows varying within this range depending on the day of week and hydrologic conditions. While this flow range is well utilized by both private boaters and commercial outfitters, the licensee has not conducted a controlled-flow whitewater boating study on this river reach using the widely accepted *Whittaker* protocols developed in 2005 to identify minimum acceptable and optimal flow ranges.



*Penobscot Gorge downstream of McKay Station*



*Cribworks Rapid on the West Branch of the Penobscot River near Telos Road*



*Rapids on the West Branch of the Penobscot River*

**Stone Dam:**

The Penobscot Mills Dryway or Stone Dam Dryway between Stone Dam and Shad Pond on the West Branch of the Penobscot River, is a 4.5-mile river reach that the licensee refers to as the "Back Channel", which has the potential to provide a highly valuable whitewater boating opportunity to paddlers with a wide range of abilities if sufficient flows were provided. Under current FERC license conditions, the licensee is not required to release any minimum flow into this lengthy river reach as all flows are diverted into the Millinocket powerhouse rather than flowing naturally into the river.

The flow diversion at Stone Dam and the dewatering of the 4.5-mile reach of the West Branch of the Penobscot River destroys aquatic habitat, obstructs sediment transport, reduces water quality, and eliminates valuable recreational boating and angling opportunities that would otherwise be available if sufficient flow were provided. This section of the river contains ample gradient and geologic features that would provide high quality aquatic habitat as well as whitewater boating and angling opportunities under appropriate flow conditions. The reach also contains Grand Falls, a significant geologic feature located 2.7 miles below Stone Dam. Rarely, flows are spilled over Stone Dam, except when upstream flows from North Twin exceed 4305 cfs and the impoundment is at capacity. Dewatered throughout the year except during high flows that are beyond the capacity of the project to store or generate power, the dewatered Grand Falls is a natural and recreational treasure along this reach significantly impacted by the projects.

Higher flows into the Back Channel can be released from an inflatable rubber flashboard system and is currently operated at times by deflating the pneumatic rubber flashboard system to provide flows of 200 cfs and then ramping up at an interval of 400 cfs an hour until downstream flow targets are met or until Stone Dam falls to 459.45 FTMSL.

This section of the West Branch has been run by numerous whitewater boaters when flows on the West Branch exceed the hydraulic capacity of the Millinocket Development. While this river reach is clearly boatable, minimum acceptable and optimal flow ranges are unknown, and the licensee has not previously performed a controlled-flow whitewater boating study using the widely accepted *Whittaker* protocols developed in 2005. Boaters previously paddling this reach have determined that this reach contains Class III/IV rapids that provide a high-quality whitewater boating experience under suitable flow conditions. as shown on the image that follows.




*West Branch of the Penobscot River Below Stone Dam Showing Spillage*




*West Branch of the Penobscot River Below Stone Dam at Grand Falls Showing Spillage (Occasional)*




*West Branch of the Penobscot River Below Stone Dam at Grand Falls Dewatered (Typical)*



*Grand Falls on the West Branch of the Penobscot River below Stone Dam on the Penobscot Mills Dryway (Unknown flow)*

Current operations affecting operation of Stone Dam are contrary to Maine Statutes.

> MRSA §467¶7C(1)f: From the outlet of Ferguson and Quakish Lakes to its confluence with Millinocket Stream - Class C.
>
> MSR Title 38 §465(4). "4. Class C waters. Class C shall be the 4th highest classification.
>
> A. Class C waters must be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; navigation; and as a habitat for fish and other aquatic life.
>
> B. Class C waters must be of sufficient quality to support all species of fish indigenous to those waters and to maintain the structure and function of the resident biological community…"
>
> C. Discharges to Class C waters may cause some changes to aquatic life, except that the receiving waters must be of sufficient quality to support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community."

Watering the reach is needed to meet Maine statutory requirements for designated uses other than hydroelectric production: fishing, recreation and habitat.

Watering the reach would be compliant with the EPA's April 2024 ruling regarding access to resources in ceded Native American lands. "The U.S. Environmental Protection Agency (EPA) is finalizing revisions to the Clean Water Act (CWA) water quality standards (WQS) regulation to add requirements for states establishing WQS in waters where Tribes hold and assert rights to CWA-protected aquatic and aquatic-dependent resources reserved through treaties, statutes, or Executive orders." [A Rule by the Environmental Protection Agency on 05/02/2024. Citation: 89 FR 35717]

Improvements to whitewater, recreation and aesthetics must be accompanied by minimum flows to support aquatic habitat.

**Millinocket Stream:**

Millinocket Stream between Millinocket Lake and Shad Pond has the potential to provide whitewater boating opportunity if sufficient flows are provided. While there is no river gage and the licensee does not publicly release flow information on spill from the Millinocket Lake Dam, whitewater boating is an existing use on this 9.4-mile river reach during spill conditions.

In its prior relicensing of the Penobscot Mills Hydroelectric Project, the licensee acknowledged the whitewater boating potential of this reach in response to FERC's AIR, stating that the reach between Millinocket Lake and Shad Pond is a recreational resource when flows greater than 250 cfs are released from the Millinocket Lake Dam including the Class III Locomotive Rips (or Choo-Choo Falls). While the information was solely based on a conversation with several boaters who previously paddled the reach, a more in-depth study is required to evaluate the recreational value of the resource more thoroughly.

**Relicensing Studies**

In response to stakeholder study requests, FERC issued a Study Plan Determination on May 13, 2022, as modified by the Study Modification Determination on July 23, 2023, requiring that GLHA conduct a number of studies that impact recreational use, habitat restoration, aesthetics, and other non-power values. Stakeholders previously filed comments in response to the Initial Study Report and Updated Study Report and incorporate those comments by reference and summarize them below. Inasmuch as GLHA has not completed all required studies or responded to all additional information requests by FERC and stakeholders, we reserve the right to file additional comments, and if necessary additional study modification requests, once those studies are complete and additional information has been provided. Studies conducted to date have failed to inform the full range of options for future project operations that will best balance project harms and benefits in this complex and highly modified river segment.

**Historic Operations Data Assessment Study**

As more fully explained in AW/AMC Initial Study Report Comments, the Ripogenus and Penobscot Mills hydroelectric projects were last licensed in 1996. At the time of the last relicensing, the project provided power to the Millinocket and East Millinocket paper mills. Those paper mills closed in 2008 and 2013, respectively, and the projects were converted to provide power to the electric grid in 2014. Although the project purpose changed in 2014 following the closure of the paper mills, the Water Management Plan, including the required minimum flows to the West Branch Penobscot bypassed reaches and Millinocket Stream, is based on the project purpose of supplying power to the paper mills at the time of the last relicensing. The study does not address historical changes in the timing of generation since the closure of the paper mills and the repurposing of the project.

The Ripogenus Dam impounds the West Branch creating a 710,000-acre-foot impoundment that fluctuates by 44 feet and causing negative impacts to Ripogenus Lake, Caribou Lake, Chesuncook Lake, Moose Pond, Brandy Pond, and Black Pond. Project operations at Ripogenus divert flows into a penstock bypassing the natural river channel, leaving .75 miles of the West Branch dewatered except for an unnatural minimum flow of 12-100 cfs when flows are less than the 3500 cfs hydraulic capacity of McKay Station. Under its current license, the licensee is required to release minimum flows at McKay Station ranging from 1000-2300 cfs at different times of day and at different times of year that support power generation, aquatic habitat below McKay Station, and whitewater boating and other recreation.

Project operations at McKay alter flows by impounding and gradually releasing flows on the West Branch. Project operations at McKay adversely affect water quality by raising water temperature and lowering dissolved oxygen in the impounded lakes, reducing sediment transport, harming the littoral zone, and limiting stream access upstream from the dam. Downstream from the dam, the natural river channel between Ripogenus Dam and McKay Station is adversely affected by the inadequate minimum flow and by the loss of naturally variable flows that have an adverse effect on aquatic habitat and whitewater boating use in the Upper Gorge. An examination of historical flow data demonstrates the infrequency of spill below Ripogenus Dam

when the impoundment is full and inflows exceed the 3,500 cfs McKay Station hydraulic capacity.

Spill below Ripogenus Dam is infrequent even during even the highest water years and is generally limited to the high flows that typically occur at tail end of the spring freshet when the impoundment fills after the annual winter drawdown. The licensee manages the project to maximize generation by lowering the reservoir elevation during the winter to avoid spill — what the study report euphemistically and offensively calls “waste flow”, but which are actually the restored natural flows to the West Branch of the Penobscot River. This artificial lowering of the impoundment reduces the number of boatable days in the Upper Gorge and beneficial effects of high flows on aquatic habitat.

Millinocket Lake Storage serves as one of several impoundments for the Millinocket Development with a fluctuating impoundment affecting upstream and downstream aquatic habitat. Flows on Millinocket Stream are diverted by Millinocket Lake Dam and then pumped to Ambajejus Lake joining inflows from the Ripogenus Project into North Twin. The pumping station was constructed in 1950 to provide additional water for generation of power for the paper mills. With the demise of the paper mills, the flow diversion and partial dewatering of Millinocket Stream provides power to the grid and profit to the licensee. Lake Millinocket and Millinocket Station essentially function similar to Ripogenus in that flows are diverted by Millinocket Lake Dam through a series of impoundments before flowing into the Millinocket Station tailrace and back into Millinocket Stream.

The effect of this diversion is the partial dewatering of Millinocket Stream leaving only a minimum flow of 60 cfs or less to support aquatic habitat. The flow diversion at Millinocket Dam disrupts river connectivity due to the lack of fish passage, obstructs sediment transport and water quality, and reduces flow variability. The licensee operates two pumps with a combined hydraulic capacity of 244 cfs to pump water from Millinocket Lake to Ambajejus Lake. The pumps typically operate from 16-63 percent of the time throughout the year, with near continuous pumping typically occurring throughout much of the warmer summer months in all water year types, often reducing outflows from 300 cfs down to a meager 60 cfs for much of the year. Since there is no gage on Millinocket Stream, the flow data is based on a calculated flow, so the accuracy of this data cannot be verified.

The Millinocket Development also functions as a typical hydropower project with Stone Dam impounding the West Branch of the Penobscot River, a bypassed reach on the West Branch of the Penobscot River below Stone Dam, and a powerhouse at Millinocket Station discharging diverted flows into Shad Pond before rejoining the West Branch at Shad Pond. Under the current FERC license, the bypassed reach of the West Branch has been completely dewatered by the Stone Dam other than minimal leakage or infrequent spillage over the flashboards.

The 1996 FERC license disregarded the environmental consequences of the complete dewatering of the West Branch below Stone Dam based on the economic impact to the paper mills owned by the then licensee, Great Northern Paper. The dewatering of the West Branch below Stone Dam can no longer be justified by the economic impact on Great Northern Paper whose paper mills no longer operate, their crumbling structures marring what would otherwise be a pristine landscape.

The dewatering below Stone Dam has disrupted river connectivity, destroyed aquatic habitat, eliminated recreation opportunities, and degraded cultural resources.

**Operations Model**

FERC's Study Plan Determination required that GLHA complete an Operations Model Study to evaluate alternative modes of operation against a baseline scenario to evaluate the impact of alternatives on water availability, power generation, aquatic resources, recreation, and other values. At the request of AW/AMC, GLHA invited stakeholders to submit various scenarios, and GLHA agreed to some but not all of the requested model runs. The model runs requested by AW/AMC were intended to simulate the following scenarios:

- Minimum flow in Upper Gorge
- Whitewater boating releases in Upper Gorge
- Minimum flow below Stone Dam
- Whitewater boating releases below Stone Dam
- Elimination of pumping at Millinocket Lake Storage
- Whitewater boating releases in Millinocket Stream

GLHA agreed to all of the model runs requested by AW/AMC with the exception of the 400 cfs minimum flow in the bypassed reach below Ripogenus Dam. Inasmuch as GLHA agreed to the 200 cfs model run requested by USFWS and the results are relatively linear, the effect of the 400 cfs minimum bypassed reach flow in the Upper Gorge can be easily extrapolated from the model run results. Below are the results of those model runs:

| No. | Scenario Name | Requestor(s) | Project Area | Summary of Alternative Scenario Evaluated by the Model** | Summary of Modeling Result: Compared to BaselineR3 | Effect of Scenario on Average Annual Generation Compared to BaselineR3 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | RIF | NTWIN | MILL | DOLBY | EMILL |
| 9 | 1000RecUpperGorge | AW/AMC | Ripogenus Bypass Flow (Upper Gorge) | • 5/1-10/1, provide 1,000 for 4 hours on 1 weekend day each week from 10:00-14:00. | • Requested scenario has minimal effects on Ripogenus impoundment elevations, timing of flows, and generation at McKay Station based on the approximately 330-acre-feet of water per release event. | 0% | 0% | 0% | 0% | 0% |
| 10 | 200UpperGorge | USFWS | | • 24/7/365, provide 200 cfs in the Ripogenus bypass reach | • Requested scenario results in slightly lower Ripogenus Impoundment elevations, as model strives to efficiently utilize McKay Station to pass downstream flows while maintaining 200 cfs in bypassed reach.<br>• Increased outflows from Ripogenus at times results in a slight increase in spill occurring at downstream developments. | -6.9% | 1.0% | 0.4% | -0.2% | -0.1% |
| 11 | 200StoneDam | USFWS MDEP MDIFW | Millinocket Bypass Flow (below Stone Dam) | • 24/7/365, provide 200 cfs from Stone Dam. | • Requested scenario results in an increase in the number days of spill at Dolby dam as compared to BaselineR3 due to the difference in timing and magnitude of releases from the Millinocket powerhouse and dam. | 0% | 0% | -4.9% | 0% | 0% |
| 12 | 400StoneDam | AW/AMC | | • 24/7/365, provide 400 cfs from Stone Dam. | • Requested scenario results in a small decrease in Millinocket Impoundment elevations as compared to BaselineR3 due to the difference in timing and magnitude of releases from Millinocket powerhouse and dam.<br>• Requested scenario results in an increase in the number days of spill at Dolby and East Millinocket dams as compared to BaselineR3 due to the difference in timing and magnitude of releases from the Millinocket powerhouse and dam. | 0% | 0% | -10.0% | -0.1% | 0% |
| 13 | 2300RecStoneDam | AW/AMC | | • 5/1 – 10/1, provide 2300 cfs from Stone Dam for 4 hours on 1 weekend day each week from 10:00-14:00. | • Requested scenario results in an increase in the number days of spill at Dolby and East Millinocket dams as compared to BaselineR3 due to the difference in timing and magnitude of releases from Millinocket powerhouse and dam. | 0% | 0% | -0.6% | 0% | -0.1% |
| 14 | NoMillLakePumping | AW/AMC | Millinocket Stream Flow | • No Pumping from Millinocket Lake Storage to North Twin. | • Requested scenario results in slightly lower North Twin Impoundment elevations and flows.<br>• Requested scenario results in slightly higher Millinocket Lake Impoundment elevations.<br>• Requested scenario results in very small differences in impoundment elevations and flows downstream of North Twin as compared to BaselineR3 due to the difference in timing and magnitude of releases from Millinocket Lake. | 0.1% | -1.6% | -1.2% | -0.1% | -0.1% |
| 15 | 600RecMillStream | AW/AMC | | • 6/1 – 10/1, provide 600 cfs from dam for 4 hrs on 1 weekend day each week for WW boating from 10:00-14:00 | • Requested scenario results in very small differences in impoundment elevations and flows as compared to BaselineR3. | 0% | 0% | 0% | 0% | 0% |

**The information in the table represents the conditions that were evaluated by the model, which may slightly differ from what was requested as indicated in the May 3, 2024 filing with FERC included as Attachment A of this report.

The results of all model runs requested by AW/AMC (including the 200 cfs bypassed reach model run requested by USFWS) demonstrate the viability of each of the AW/AMC requested scenarios. Specifically, the model runs demonstrate the following:

- Providing 1000 cfs whitewater releases from Ripogenus Dam into the Upper Gorge one weekend day each week for four hours from May 1 to October 1 will have no effect on annual

generation.

- Providing 200 cfs bypassed reach flow in the Upper Gorge, rather than the current 12/100 bypassed reach flow, will result in a 2.6% reduction in total generation reduction at Ripogenus and Penobscot Mills.
- Providing 400 cfs bypassed reach flow below Stone Dam, rather than the current no bypassed reach flow (leakage 12/121 cfs), will result in a 3% reduction in total generation reduction at Ripogenus and Penobscot Mills. Unclear whether this accounts for leakage flows.
- Providing 2300 cfs whitewater releases from Stone Dam into the West Branch bypassed reach one weekend day each week for four hours from May 1 to October 1 will have a 0.2% effect on annual generation. This effect would be reduced in the likely event that a minimum flow from Stone Dam into the West Branch is required under a new project license.
- Eliminating pumping from Millinocket Lake Storage into North Twin impoundment will result in a 0.5% reduction in total generation reduction at Ripogenus and Penobscot Mills.
- Providing 600 cfs whitewater releases from Millinocket Lake Storage Dam into Millinocket Stream one weekend day each week for four hours from May 1 to October 1 will have no effect on annual generation.

Overall, these operations model runs demonstrate that providing scheduled whitewater boating releases in the Upper Gorge and Millinocket Stream will have no effect on generation at the projects, and that providing scheduled whitewater boating releases below Stone Dam will have a negligible effect on generation. The Level 1 whitewater boating study on these three reaches and comments by numerous stakeholders demonstrates that the Upper Gorge, Stone Dam, and Millinocket Stream river reaches are highly desirable by a wide range of recreational users and would provide more natural river functions when paired with appropriate minimum and variable flows. Additionally, eliminating pumping operations from Millinocket Lake and ending the flow diversion into North Twin will have minimal effect on generation and would restore flows and natural river function to Millinocket Stream.

In addition, AW; AMC; TU; Caribou, Chesuncook Lake Camp Associations; Chesuncook Dam Camp Owners Association; the Allagash Gateway Campground; and Andre Emerson Cushing Corporation submitted a joint request for ops model runs that would accommodate additional requirements. Brookfield rejected this request. These organizations will next focus on agreeing on sets of ops model runs that will be submitted in the near term. This will include scenarios outside the limits that Brookfield has dictated for the model runs.

A key issue regarding the Ops Model remains the fill elevation for the lake. Even though a Brookfield representative stated at the USR Meeting that Brookfield had filled Ripogenus-Chesuncook Lake to over 939 asl this spring, Brookfield refuses to conduct Ops Model runs above that elevation. Brookfield's own data shows that it has filled the lake to above that level often in the past: Operations data from 2010-2022 shows lake elevation on May 15th at 940 asl or above every year except 2012, 2013, 2015, 2016 and 2021. Given these data, the upper limit should be 941.6 asl, the physical, but safe limits created by Ripogenus Dam. By failing to run the Ops Model at a more realistic and historically accurate fill regime, Brookfield is misleading the available fill volumes, making less profitable flow scenarios seem less feasible than they truly are. Stated another way, if Brookfield raised the lake fill level, it could offset or at least mitigate the economic impacts of increased minimum flows required for other purposes. This 2.6 feet of

elevation equates to billions of cubic feet of water with enormous potential use, not just for power generation but to provide flows to maintain lake levels allowing access to boat ramps in Ripogenus-Chesuncook Lake and flow into Ripogenus Gorge to create both whitewater and recreational fishing opportunities as well as improve the aquatic habitat. It is well established that Brookfield uses even smaller amounts of water level variance elsewhere in Maine in its many run-of river projects to conduct peaking operations, varying flows to maximize the profitability of its electricity, but degrading both the aquatic habitat and recreational fishing opportunities in the process. Efficient management of lake fill levels can mitigate this degradation.

**Recreation**

As more fully explained in the AW/AMC Initial Study Report and Updated Study Report Comments, GLHA conducted a recreation study as required by FERC's Study Plan Determination and Study Modification Determination evaluating both formal and informal recreation sites. While the study report collected useful data on formal and informal recreation sites, the report's conclusions that all recreation sites are in good condition and its failure to make recommendations for improvement is unsupported by the study results. The deficiencies in the study report are particularly egregious at the whitewater boating access sites where the need for improvements is apparent. In the Upper Gorge, for example, there is no marked or improved trail leading down to the river that would enable whitewater boaters, as well as anglers and hikers, to easily descend the steep embankment to boat this river reach when sufficient flows are present, enable access tranquil fishing spots, or enjoy aesthetic views of the Upper Gorge.

At McKay Station, the rafting put-in needs improvement to provide safe river access. Additionally, there is no sanitation at the lower access area where rafters are dropped off as the only portable sanitation unit is locked. There is no signage directing rafters to summit the steep access road to locate the toilets at the upper parking area. The access road to the lower drop off location is available only to commercial outfitters but not to other boaters.

At Stone Dam, there is no clearly marked parking area across Quakish Lake, there is no easy egress at Stone Dam, and no land access to Stone Dam is provided. These areas are all used during spill events when flows are restored to these river reaches; however, the difficult access and lack of real-time flow information inhibit recreational use. To assess project effects on this recreation opportunity, the licensee needs to expand the geographic scope of the study to include informal recreation access areas identified by stakeholders.

In performing its NEPA analysis of project effects, we encourage FERC to carefully examine the study data in the recreation and whitewater boating study reports and stakeholder comments rather than GLHA's unsupported conclusions about the adequacy of formal and informal recreation sites. Given that GLHA has declined to prepare a Recreation Management Plan, we request that FERC develop appropriate PM&E measures that address project effects on recreational resources including adequate parking and river access. We also recommend that this study be read in conjunction with the operations model study, angler flow study, whitewater boating study, and the USGS gage study as these studies and potentially others are intended to address project effects on recreational resources. These measures should include flow and impoundment level notification, safety signage, parking, sanitation, recreation flow releases, and

improvements to access in impoundments, bypassed reaches in the Upper Gorge, Stone Dam, and Millinocket Stream, and riverine reaches affected by project operations.

**Whitewater Boating**

At the request of AW/AMC and following FERC's Study Plan Determination, GLHA conducted a whitewater boating study to assess project effects on whitewater boating opportunities on four river reaches in the project boundary: 1) Upper Gorge between Ripogenus Dam and McKay Station; 2) Below McKay Station to Debsconeag; 3) Millinocket Stream below Millinocket Lake Dam; and, 4) West Branch between Stone Dam and Shad Pond. The intent of the study is to assess potential whitewater boating opportunities and to identify the acceptable and optimal flow ranges for whitewater boating by individuals currently or potentially utilizing these river reaches under current or alternative modes of operation, evaluate the adequacy of put-in and take-out locations and the need for access improvements, and identify flow information needs that would support whitewater boating use. FERC-approved whitewater boating studies routinely follow the standard methodology as described in Whittaker et al., in "*Flows and Recreation: A guide to studies for river professionals"* (2005). This methodology is designed to assess the presence, quality, and preferred flow ranges for river-based boating resources in a stepwise manner. The process steps are generally 1) desktop analyses, 2) on-land feasibility assessment, and/or on-water single flow assessment, 3) on-water multiple flow assessment.

While AW/AMC requested that GLHA follow the full study methodology with appropriate off ramps before proceeding to the next stage, GLHA initially conducted only a Level 1 desktop analysis on each of the four river reaches identified by American Whitewater. The Level 1 component of the study was sufficient for the McKay Station and Millinocket Stream in that it confirmed that these two-river reaches provide valuable whitewater boating opportunities when sufficient flows are present.

The reach below McKay Station has long been considered the premier whitewater boating run in New England containing scenic gorges and powerful hydraulics that provide thrilling rafting and kayaking opportunities throughout the summer. While this region in Maine was once known for its paper mills that were the mainstay of the local economy, today the region is known for its outdoor recreation that drives the local economy. Rafting the West Branch below McKay Station draws tourists from throughout the country to experience the scenic views and rapids below the powerhouse. Whitewater boating flows from McKay Station are required under GLHA's current license and range from 1800 to 2300 cfs depending on the water year type and day of the week throughout the boating season. Whitewater boating below McKay Station results in no loss of generation.

In addition to the reach below McKay Station, Millinocket Stream below Millinocket Lake Dam has the potential to offer whitewater boating opportunities of a very different character. Over the past three years, the annual Millinocket X-Stream Canoe Race has been held on this section of the river. The race is a 7.3-mile whitewater race for canoes, kayaks, and paddle boards on the Millinocket Stream in Maine. This section is appropriate for both novice and intermediate boaters. The annual event has drawn up to 100 participants and demonstrated considerable paddler and spectator interest. Opportunities to boat on Millinocket Stream are extremely limited

due the GLHA's current operations that divert flows into Millinocket Lake into North Twin impoundment through pumping operations that leave Millinocket Stream without sufficient flows for boating throughout most of the year. The primary obstacles to recreational boating at Millinocket Stream are the lack of boatable minimum flows, pumping operations, the lack of real-time flow information, and the lack of scheduled boating releases required under the current license.

While the Level 1 analysis at McKay Station and Millinocket Stream was sufficient to identify minimum acceptable and optimal flow ranges and no further study was necessary on these two river reaches, insufficient information was obtained on the potential whitewater boating opportunities in the Upper Gorge and on the West Branch below Stone Dam and further study following the Whittaker methodology is warranted. While the Level 1 study was insufficient, it did provide limited information demonstrating the whitewater boating potential of the Upper Gorge and Stone dam sections.

Flows below Ripogenus Dam into the Upper Gorge dryway are infrequent due to GLHA's flow diversion at Ripogenus into the penstock for power generation. Local paddlers have boated this reach infrequently when inflows exceed the hydraulic capacity of McKay Station and impoundment storage is at maximum capacity. While there is no flow gage in the bypassed reach and GLHA does not report bypassed reach flows on the Safe Waters website, local boaters have reported that this reach contains highly valuable whitewater boating opportunities at a variety of flow levels.

At lower flows, perhaps 600 cfs by some reports, this reach provides intermediate boating above McKay Station. At higher flows, perhaps 1000 cfs, rapids become more challenging as hydraulics become more powerful. At a range of flow levels, paddlers have reported that paddling the Upper Gorge is important because it considerably lengthens the whitewater boating run through the Ripogenus Gorge below McKay Station by adding as many as six additional rapids to the run providing more appealing recreation opportunities for advanced and expert paddlers. Current minimum flows of 12 to 100 cfs are insufficient to provide whitewater boating opportunities in the Upper Gorge dryway. The primary obstacles to use of this river reach are the flow diversion, lack of boatable minimum flows, lack of scheduled releases, and the inadequacy of access from the Ripogenus hiking trail down to the river.

As with the Upper Gorge, the section of the West Branch below Stone Dam is a hidden whitewater boating resource that is largely dewatered by the Penobscot Mills project. With no required minimum flow below Stone Dam under the current license, the only flows present in this dewatered river reach come from leakage from flashboards, spill when inflows into Quakish Lake exceed the hydraulic capacity of the Millinocket Development, or backflow from Shad Pond. There is no real-time flow gage on the West Branch below Stone Dam and this information is not reported on the Safe Waters website. Access is also a major impediment to use as GLHA does not allow public access though its easement and accessing Stone Dam via Quakish Lake involves a 2-mile flat water paddle. Access may also be available to lands on the river right over lands controlled by Katahdin Forest Management.

Over the years, this section of the West Branch has been paddled by whitewater boaters at various flows, but not enough is known about minimum and optimal boating levels. At very high flows, this run provides a continuous series of Class III.IV rapids as the river approaches Grand Falls, a Class IV rapid with challenging hydraulics suitable for intermediate and advanced paddlers. At lower flow levels, the run is suitable for intermediate paddlers. At the request of American Whitewater, FERC required GLHA to proceed with the Level2 study phase including an on-water flow evaluation. As described in more detail in our Updated Study Report comments, GLHA has the capacity to release variable flows from its inflatable gate structure including flows of 2000 cfs to meet minimum downstream flow requirements when the Millinocket powerhouse trips offline. Through the Level 2 study phase, we intend to evaluated the boating potential of this river reach at this flow level and reserve the right to supplement our comments when the final study report is completed.

**Aesthetics**

GLHA was required to perform an aesthetics study to evaluate project effects on aesthetic view opportunities at both projects. Regrettably, this study was conducted in a way that poorly informs FERC NEPA analysis. Rather than evaluate the aesthetic effect of impoundment fluctuations, flow diversions, and peaking operations, GLHA randomly photographed lakes and omitted views that highlight degraded aesthetic view and then evaluated those views using its own paid consultant, and later, asked stakeholders to review those same photographs. In a subsequent phase, it allowed a study group to view these locations in person at additional locations, but the result was more of an anecdotal opinion survey rather than a systematic assessment of aesthetic impact of project operations. Missing from this study is an evaluation of shoreline aesthetics at minimum and maximum impoundment levels, as well as views of the Upper Gorge at various levels from both Ripogenus Dam and the lower Ripogenus Gorge. Comments filed by numerous stakeholder and comments at the scoping and study report meetings attest to the negative impact of project operations at impoundments and dewatered river reaches at the projects.

**Compliance Issues**

July 7, 2023 McKay Station Trip Event. FERC Compliance has not resolved the complaint regarding the event. No interim solution has been identified. Video obtained during the Ramping Study on July 14 and 24, 2024 shows that additional mortality can occur even when flows are reduced to 1000 cfs in the vicinity of the McKay Station hydro discharge.

Millinocket Stream Stocking. Recent stockings have violated the Penobscot Mill Project License, Article 413 that requires brook trout, three to a pound, be stocked in May. Additionally, larger brook trout are stocked in mid-October after local fishing interest has diminished. If this can't be corrected, other more effective mitigation should be discussed."

Holbrook Bypass flows. Flows provided during generator trip events violate Article 406 of the current license. The bypass was designed to provide flows when main river flows are in the 2400 cfs range. The bypass was designed to support the landlocked salmon population by providing needed juvenile recruits. When flows decrease, the bypass is no longer suitable landlocked

salmon rearing habitat. The habitat has largely been taken over by brook trout juveniles. “We simply request that the Licensee continue to operate and maintain the Holbrook Side Channel as outlined in the current license, Order approving recommendations of habitat improvement plan under Article 406.” [MDIFW PAD Comments October 8, 2021, page 12]. The bypass was a mitigation measure included in the current license, higher base flows restore this mitigation measure.

**FERC Process**

The Signatories request that an Environmental Impact Statement (EIS) be required for these relicensings in lieu of an Environmental Analysis (EA). This is necessary because of the size and complexity of the projects, and has the potential to highlight deficiencies in project studies.

**Preliminary NGO Request for New License Terms and Conditions**

The Signatories submit their list of desired features for incorporation into the new license as Attachment A.

**Conclusion**

The signatories appreciate the opportunity to submit these comments on the Draft License Application for the Ripogenus – Penobscot Mills relicensing.

Respectfully submitted on August 1, 2024,

American Whitewater
Bob Nasdor
Northeast Stewardship & Legal Director

Appalachian Mountain Club
Mark Zakutansky
Director of Conservation Policy Engagement

Allagash Gateway Campground
Andre Emerson Cushing Corporation
Benjamin Worrell
Legal Council

Chesuncook Lake Camp Association
Chesuncook Dam Camp Association
Bill Houston
Designated Representative

Maine Council of Trout Unlimited
Stephen G. Heinz
Maine TU Council FERC Coordinator

American Rivers
Andrew Fisk, Ph.D.
Northeast Regional Director

Maine Rivers
Charles Owen Verrill, Jr., Esq.
President, Board of Directors

Chris Howe

Ed Spear

Atlantic Salmon Federation
John R.J. Burrows
Vice President, U.S. Operations

**Attachment:**

Preliminary Stakeholders Requests for Inclusion in Ripogenus and Penobscot Mills License

# ATTACHMENT

# Preliminary Stakeholders Requests for Inclusion in the Ripogenus and Penobscot Mills Licenses

**Ripogenus-Chesuncook Lake**

1. Fill the lake to 940.6 (1 foot below full pond) by May 15th, drawdown no more than 1 foot every 28 days until July 31.

Justification:

a. Meets loon habitat and nesting requirements
b. Provides for smelt spawning and incubation
c. Promotes shorebird nesting
d. Potential protection of wood turtle reproductive sites
e. Maintains and stabilizes the littoral zone (plankton and juvenile smelt)
f. Provides water for summer recreation needs
g. Parallels MEDEP and MDIFW Operations Model requests
h. Provides water for summer recreation, fisheries and generation needs
i. Mirrors current plan for other project lakes
j. Meets or restores ME DEP water quality standards
k. Supported by GLHA Water Use Plan in current license

2. Maximum 1 foot lake drawdown per month from July 31-October 15, maintaining a minimum lake level of 935.6 on October 15

Justification:

a. Supported as possible (within 1 foot) by Ops Model run with minimal downstream impact
b. This was accomplished in 2013, a dry/average hydrologic year, while still generating 238,835 mw
c. Boat landings remain usable
d. Provides for the gradual drawdown cited in DLA and other GLHA submissions
e. Maintains aesthetic value of lakes
f. Provides safe lake access
g. Ensures remote campsites are safely accessible and aesthetically pleasing
h. Provides salmonid access to tributary streams
i. Provides improved angler access to the Upper West Branch (September)
j. This will provide habitat conditions at the confluence of Umbazookus Stream suitable for Lake Whitefish spawning activities: staging, spawning, and post spawning out migration. Allagash Stream offers nearby adult Lake White fish as a donor source therefore, a small undetected relic population may exist, and this elevation provides an opportunity for natural recolonization.

k. Reduces navigation hazards
l. Meets or restores ME DEP water quality standards
m. Supported by GLHA Water Use Plan in current license

3. Set the operating (when power is being generated) minimum at McKay Station flow at 2400 cfs during the biological growing season (May1 -October 15) and at 2200 cfs from October 16-april 30th

Justification:

a. Similar to how operated under Great Northern Paper and supported by the 1996 Flow Management Plan
b. The water is available if McKay Station operations are modified.
c. Meets Maine Department Water Quality Standards
d. Stabilize aquatic macroinvertebrate populations
e. Stabilize habitats for various fish populations
f. Restore fishing opportunity to its historic levels (1978-1991)

4. Provide river flows capable of meeting required Holbrook Bypass channel (article 406) flows or reengineer the Bypass gate system to meet the required flow during low flow events.

Justification:

a. The Bypass was designed to provide flows when main river flows are in the 2400 cfs range.
b. Support the Landlocked salmon population by providing needed juvenile recruits
c. When flows decrease, the Bypass is no longer suitable landlocked salmon rearing habitat. The habitat has largely been taken over by brook trout juveniles.
d. "We simply request that the Licensee continue to operate and maintain the Holbrook Side Channel as outlined in the current license, Order approving recommendations of habitat improvement plan under Article 406." [MDIFW PAD Comments October 8, 2021, page 12]
e. The bypass was a mitigation measure included in the current license, higher base flow restores this mitigation.

5. Water Upper Ripogenus Gorge year-round at higher than leakage flows with minimum flows of 350 cfs. From June 15 to September 15, this must be from a deep gate, not the sluiceway. These flows would be subtractive from summer whitewater flow requirements. Example: 2400 cfs would be supplied by 2050 cfs from McKay Station, 350 cfs from a deep gate release.

Justification:

a. Higher, year-round flows support fishing and aesthetics
b. Provides new whitewater paddling and buffers generator trip events
c. Water over the sluiceway currently provided is the warmest in the lake and does not provide the fishing flows the release was designed to provide. An IFIM from last relicensings shows the fisheries value. [Need quote, cite] 350 cfs has been requested by the whitewater community.

d. Current sluiceway 100 cfs sluiceway flows from July 1 to September 30 are attractive to fallfish, not the salmonids that are sought after recreationally. The 100 cfs does not achieve its design purpose.

e. Current dewatering practices (9 months out of the year) are contrary to Maine environmental law, the habitat cannot be considered unimpaired.

1. MRSA §467¶7C(1)c: From Ripogenus Dam through Ripogenus Gorge to the McKay powerhouse - Class B.
2. MRSA §465¶3A: "3. A. Class B waters must be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; navigation; and as habitat for fish and other aquatic life. The habitat must be characterized as unimpaired. [PL 2003, c. 227, §3 (AMD); PL 2003, c. 227, §9 (AFF); PL 2005, c. 561, §10 (AFF).]"
3. MRSA §466(11): "Unimpaired" means without a diminished capacity to support aquatic life."

f. 350 cfs minimum flows in Ripogenus Gorge would satisfy Maine statutory requirements for designated uses other than hydroelectric production: fishing, recreation and habitat.

6. Whitewater releases for Rip Gorge from 5/1-10/1, flows 1000 cfs, 1 weekend day weekly, 4 hours

Justification:

a. Ripogenus Gorge contains sufficient gradient and structure resulting in a continuous series of rapids between Ripogenus Dam and McKay Station suitable for intermediate to advances whitewater boaters

b. This reach is suitable at a range of flow levels with flows between 600 cfs to 1000+ having been identified as optimal.

c. Substantially extends the length of whitewater boating reach that would otherwise begin at McKay Station.

d. Operations Model indicates this is possible with little to no impact on project generation.

e. Whitewater boating study and comments by public indicate that there is substantial demand for boating in the Ripogenus Gorge dryway.

7. Require mid-winter assessment and reporting of snowpack, long and short-term weather forecasts, and impoundment levels to determine if operations modifications (e.g. reduced outflow) are necessary to secure water for spring refill.

Justification:

a. With greater energy demands predicted for the winter months (ISONE Report to Maine Legislature, Jan, 2023) this needs to be done to support spring refill.

8. USGS gauge installed to record and report levels and flows - located between Little and Big Eddy Pool. Include a temperature gage as is usually installed at a USGS flow gage site.

Justification:

a. The updated Study Report (USR) contains information in Appendix B.
b. Exact location would be determined by further study.
c. Implementation would be relatively easy to accomplish.
d. This is the new license provision with the highest likelihood of adoption.

9. Lake level elevations for all sites (including storage ponds) reported on Safe Waters.

Justification:

a. Lake boaters need to know this information for safe navigation and to be able to anticipate the condition of the boat landings, and other access.
b. Relatively easy to accomplish
c. This is public information that is currently available for North Twin and Millinocket Lakes

10. Set minimum flows for trip events and other conditions based on empirical data.

Justification:

a. There is no study data to support minimum flows in the current license and minimum safe flows are unknown> 1422 cfs is the aquatic base flow based on a rough guideline, 1300 cfs is unsupported by data, 1000 cfs is a round number, 400 or 500 cfs has been demonstrated to strand and kill fish and macro-invertebrates.
b. TU repeatedly requested flows below 1000 cfs during the Ramping Study that Brookfield refused to provide
c. Reports from ramping Study volunteer observers were that even at flows of nominal 1000 cfs in the reach below Little Ambejackmockamus Falls known to be a major spawning area, some gravels were exposed and others were covered only by 2 to 3 inches of water.
d. Ramping Study volunteers reported stranded, dewatered caddis larvae with minimum mobility that were exposed during nominal 1000 cfs flows
e. Without further study, biologically appropriate minimum flows must be assumed to be aquatic base flows of 1422 cfs per longstanding USFWS guidance for the Northeastern United States [USFWS Interim Regional Policy for New England Stream Flow Recommendations, dated May 11, 1999].

11. Adopt conditions that restrict peaking TDB maintain 1800 to 2400 cfs flows during the growing period, May 1 to October 15.

Justification:

a. MDIWF request: [MDIFW PAD Comments October 8, 2021, page 12] “As the literature is replete with examples of the detrimental impacts on the riverine fisheries and aquatic communities from rapid changes in flow, and that the literature indicates that flow changes of less than 25% per hour (ramping rate) can mitigate impacts from peaking power, we request flow records to evaluate the frequency of flow changes that exceed 25%.”

b. Reduce caddis mortality, especially Hydropsyche and Rhyacophila.

c. Reduce strandings shown to occur when switching between one, two or three generator operations.

d. Improved flow stability benefiting overall health of the system.

12. Decrease the number and severity of “flow excursions” through automated flow restoration at Rip/McKay and/or restore dam keeper

Justification:

a. Generator trip events that were demonstrated to strand and kill fish and macro-invertebrates. happen on the average of once a year and last for over 4 hours according to Brookfield’s own data. This is unacceptable.

b. Automated Rip deep gates or reinstalling a dam keeper would result in reducing down time and provided for Brookfield’s stated concerns for safety in Ripogenus Gorge.

c. Brookfield’s stated concerns for safety in the Ripogenus Gorge are unsupported by logic or study data. They are only designed to keep from having to water Ripogenus Gorge.

13. Develop an operational Ripogenus project “Rule Curve” based on 1972 to -present mass inflow data and a full pond elevation of 941.6 feet. This will provide lake level guidance and should include a drought or "low water" year plan.

Justification:

a. Currently, Chesuncook, Caribou and Ripogenus lakes water is the “go to” source of water during drought years, causing profound drawdowns and associated negative impacts

b. Low water modifications need to be spread across all user groups

c. As with above requests, items 1-3, this will protect fisheries, aquatic communities, commercial, private and public recreational users and public recreational sites.

d. Rule curve will help secure year-round water storage

e. Used successfully by Great Northern Paper from 1972-2002 and accepted by FERC in the 1996 Environment Impact Statement.

14. Restore whitefish to Ripogenus - Chesuncook Lake

Justification:

a. Whitefish present in last relicensing.

b. Whitefish not sampled in latest assemblage studies.

c. Project operations a major factor in extirpation. Varying lake levels are the most likely cause.

**Penobscot Mills**

1.Reduce minimum flows from North Twin from 2000 cfs to 1500 cfs

Justification:

a. Maintain upstream lake levels and all associated benefits.
b. Only lowers North Twin .7 feet during the recreational season according to the Ops Model.
c. Adequate for downstream requirements.
d. Provides additional flexibility for releases upstream.
e. Need for downstream dilution no longer exists.

2. Water the West Branch below Quakish Lake / Stone Dam year-round with more than leakage flows of 700 to 1000 cfs minimum flow.

Justification:

a. This would maintain macroinvertebrates and landlocked salmon fishery of all life stages, not just brook trout and juveniles.
b. This could provide a new year-round fishery
c. Brookfield's aquatic habitat study shows that higher flows would support adult salmon and brook trout fisheries
d. This would provide new paddling and whitewater opportunities
e. Current operations are contrary to Maine Statutes

MRSA §467¶7C(1)f: From the outlet of Ferguson and Quakish Lakes to its confluence with Millinocket Stream - Class C.

MSR Title 38 §465(4). "4. Class C waters. Class C shall be the 4th highest classification.

A. Class C waters must be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; navigation; and as a habitat for fish and other aquatic life.

B. Class C waters must be of sufficient quality to support all species of fish indigenous to those waters and to maintain the structure and function of the resident biological community…"

C. Discharges to Class C waters may cause some changes to aquatic life, except that the receiving waters must be of sufficient quality to support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community."

f. This would need Maine statutory requirements for designated uses other than hydroelectric production: fishing, recreation and habitat
g. Watering the reach would be compliant with the EPA's April 2024 ruling regarding access to resources in ceded Native American lands. "The U.S. Environmental Protection Agency (EPA) is finalizing revisions to the Clean Water Act (CWA) water quality standards (WQS) regulation to add requirements for states establishing WQS in waters where Tribes hold and assert rights to CWA-protected aquatic and aquatic-dependent resources reserved through treaties, statutes, or Executive orders." [A Rule by the Environmental Protection Agency on 05/02/2024. Citation: 89 FR 35717]

h. Watering the main channel instead of diverting the water to the Millinocket Project would not affect downstream minimum flow requirements.

i. The only objection to higher flows is that the water would no longer be used for generation, and Brookfield's profits would suffer.

3. Establish fish passage for indigenous anadromous species over their former range, upstream extent: Shad Pond and Millinocket Stream and eel passage in Penobscot Mills System. River herring include alewives and blueback herring.

Justification:

a. These waters are within the historical range of anadromous fish.

b. The Penobscot Indian Nation was promised a sustenance fishery in the Penobscot that has yet to be delivered. This would be a step in restoring the fishery.

c. Restoration of anadromous species would improve the overall health of the watershed.

d. Restoration would aid Atlantic salmon restoration in the greater watershed, especially in the critical Atlantic salmon habitat that is downstream.

e. NGOs should support MDMR requests

f. "Put shad back in Shad Pond."

g. MDIFW has expressed concerns that this would introduce invasive species. A sorting facility could prevent this problem.

h. Denying fish passage to indigenous species is contrary to Maine statute as interpreted by the courts;

S.D. Warren Company v. Board of Environmental Protection, 2005 ME 27, 868 A.2d 210 (2005) ("S.D. Warren I"); S.D. Warren Company v. Board of Environmental Protection, 547 US 370 (2006) ("S.D. Warren II"). In S.D. Warren I at 442, the Court concluded that the narrative criteria at 38 M.R.S.A. § 465, which requires waters "of sufficient quality to support all indigenous fish species," was intended to be an integral part of the water quality standards for the BEP to consider. The Court also concluded, based upon the specificity of the designated uses at 38 M.R.S.A. § 465, that the Legislature's purpose for the language "suitable for the designated uses" was "that the designated uses actually be present." The court also stated that when those uses are not presently being achieved, the Legislature intended the quality of the water be enhanced so that the uses are achieved (internal citations omitted).

4. Provide whitewater releases into the West Branch below Stone Dam 1 weekend day weekly at 2300 cfs for 4 hours from 5/1-10/1.

Justification:

a. The West Branch between Stone Dam and Shad Pond contains sufficient gradient and structure to provide high quality whitewater boating opportunities with sufficient flows.

b. Continuous Class II/III rapids at suitable flows.

c. Grand Falls is a significant Class III/IV whitewater boating feature.

d. Aesthetic views of the West Branch below Stone Dam from the water are exceptional.

e. Whitewater boating opportunities are available at a range of flows above 1000 cfs with optimal flows being estimated as above 2000 cfs. Boating study is ongoing.

f. GLHA has the ability to release at least 2000 cfs through its inflatable gate structure that provides pond level control according to its LIHI application.
g. Operations Model indicates this is possible with little impact on generation.

5. Provide whitewater releases into Millinocket Stream on 1 weekend day weekly at 600 cfs for 4 hours from 5/1-10/1.

Justification:

a. Scenic Class II river reach below Millinocket Lake and Millinocket
b. Current 60 cfs minimum flow inadequate for boating
c. Annual Millinocket X-Treme Canoe Race demonstrates strong recreation demand
d. 600 cfs provides optimal flow for novice boaters
e. Water from Millinocket Lake pumped to North Twin for generation, reducing flows available for recreation on Millinocket Lake.
f. No effect on generation based on Operations Model.

6. Ceasing pumping at Millinocket Lake 5/1 - 10/1

Justification:

a. No pumping from Millinocket Lake into North Twin during summer boating season.
b. Pumping would still occur during higher flow period (e.g., spring freshet).
c. Pumping allowed when the project would otherwise spill utilizing excess water.
d. Little effect on generation.
e. Reserve water in Millinocket Lake for recreational use in Millinocket Stream during the recreational boating season.

**General Project Requests to Enhance Recreation**

1. Add lands to project boundary

Justification:

a. Recreation sites and recreation access related to project effects and operations should be included in the project boundary, which may include, but not limited to:
b. Vehicle access, including parking, to the Penobscot River at Stone Dam
c. Vehicle access, including parking, to the Millinocket Lake outlet
d. The public should be allowed to visit and enjoy these areas and to access the Penobscot River below Stone Dam and Millinocket Stream below Millinocket Lake for whitewater paddling, fishing, and other purposes.
e. Since flows are controlled by the licensee into these river reaches, the licensee should be required to provide public access.

2. Protect/maintain parking for fishing access sites along the Golden Road and below Telos Bridge

Justification:

a. The Golden Road is being allowed to change to gravel from paved road.
b. Plowing is obscuring pull offs for parking to access popular fishing spots.
c. Photos taken July 25, 2024 graphically illustrate the problem
d. There is a growing safety hazard from logging trucks.
e. A mechanism needs to be in place to protect parking over the 40-year span of the new license.

3. Improve Gorge Trail improvements to include new signage of parking areas, a kiosk, map of the trail showing scenic overlooks, length and slope, as well as showing trail access to the river. The trail needs more regular maintenance to clear back overgrowth, remove blowdowns, and fix drainage issues. Side trails need to be developed and added to connect to water level creating a trail network for public use.

Justification:

a. Assess will be needed to access improved fishing and paddling opportunities that minimum flows in Ripogenus Gorge will provide.
b. Aesthetics study does not provide photos showing contrasting flow levels in Upper Ripogenus Gorge.
c. NGOs working with local groups and individuals to obtain photos of the gorge at various flow levels.

4. Develop a comprehensive Recreation Management Plan that includes a robust maintenance schedule for all recreation sites, in collaboration with stakeholders, including but not limited to:

- Significant increases in the size of parking lots at launch sites at the project lakes. Almost every survey and focus group identifying parking as far too limited at boat ramps and launch sites.
- Rebuild boat launches that are too steep and not meeting user expectations such as Dead Man's Curve, and McKay Station which is both an extremely long walk for private boaters and on very uneven terrain.
- Correct deficiencies with boat launch docks noted by some users.
- Consistent kiosks, signage and maps at all recreation sites that shows all natural and recreational features that a user map encounter, as well as public safety information.
- A winter recreation specific map, focused on snowmobile, cross-country skiing and other winter activities that frequently use project boat launches for access to frozen lakes. Develop and coordinate with the greater Millinocket winter trail network to establish a comprehensive winter recreation plan.
- Providing real-time data of lake elevation levels for motorized and non-motorized users.
- Add new public access as a FERC approved recreation site to the Stone Dam site, perhaps along the existing GHLA road at the toe of Stone Dam from the east or through the Wildlife Management Area.
- Add new public access as a FERC approved recreation site at the outlet of Millinocket Lake to Millinocket Stream, perhaps along the existing road from the west used by GHLA to access the outlet.

- Add additional public access sites to the Wildlife Management area providing for more clear information and access for public use of these 2,300 acres for hunting, fishing, hiking, camping, dispersed recreation, and environmental education of the wildlife management activities taking place. A specific property management plan for this site, in concert with wildlife managers, should be developed to allow for increased and robust public uses for recreation while maintaining habitat values.

Justification:

a. The trails, recreation sites, and boat launches need to be monitored and maintained to ensure best access and experience, and maintenance plans should be developed and included in a comprehensive recreation management plan.

b. Trails, recreation sites, and boat launches are lacking basic amenities that the public demands, such as sufficient parking, docks, kiosks with recreation maps and other information, clearly marked signage of parking areas and directional signage to recreation sites, trailblazes, and seasonally appropriate information such as winter snowmobiling route finding and points of interest in the winter that may differ from the warm seasons.

c. New public access points are needed below Stone Dam, at the Millinocket Lake outlet, and the Wildlife Management Area.

d. The Wildlife Management Area represents a very large land area in the project boundary that can be better utilized for public use and enjoyment. The access road off of Route 11 has no signage, information about recreation opportunities or wildlife management activities, and is not integrated in the growing outdoor recreation amenities offered in the greated Millinocket area. Even community generated content on sites like AllTrails and Strava shows that the public is not visiting this area. A comprehensive site management plan should be developed in concert with stakeholder to fully realize the potential of these lands and the access that they provide to the Penobscot River below Stone Dam.

e. Users consistently reported in surveys and focus groups that parking at almost all boat launch sites was inadequate and that parking lots were frequently at capacity.

f. Access at Stone Dam and at the Millinocket Lake outlet are needed for project related recreation.

g. Expand winter recreation opportunities and coordinate them with surrounding landowners.

h. Some commenters found boat launches to be too steep and hard to use.

5. Remove fencing by around project facilities, McKay Station.

Justification:

a. MDIFW requested stream access to project sites are presently blocked by fencing.

b. Fencing needs to be removed at McKay Station, North Twin and Mill One.

c. Access needs to be provided at Stone Dam and the Dolby tailrace to support fishing and paddling recreational uses.

6. Improve access to the Debsconeag Falls area to support fishing and boating.

Justification:

a. Debsconeag Falls is a solid class 4/5 rapid located just over 2 miles below the existing Nevers Corner take out for commercial rafting. It would offer an excellent addition to the whitewater currently offered in the area but is almost never used by either private boaters or the commercial industry due to the poor quality of the access road leading to it.
b. It also offers an additional strong fishing opportunity that suffers the same lack of use.
c. Improvement of the road would provide additional class 4/5 boating opportunity and increased fishing opportunity with no change in flows from the baseline.
d. Adds opportunity without system management changes.

7. Establish boating/rafting/fishing access near Abol Bridge, on river right just below the bridge, or at another suitable site in the area with suitable parking.

Justification:

a. Demand for softer adventure on the river has grown at a time when the Rafting industry as a whole has contracted.
b. Providing a suitable access or egress point at Abol Bridge would allow for better service and accommodation for the growing user group that seeks softer adventure than is currently available on the West Branch of the Penobscot

8. Provide boat (launching) access to the base of Pockwockamus Falls, an historical May-early June fishing (boat) fishing area

Justification:

a. Needed to access the resource.
b. This access is frequently used by fishermen and women and boaters seeking to avoid the more difficult whitewater above.

9. Provide access by road to the east bank of the West Branch below Stone Dam.

Justification:

a. Providing minimum flows below Stone Dam at any reasonable level will provide fishing, paddling and perhaps whitewater opportunities.
b. Currently, the west shore is accessible using logging trails.
c. There is no good access from the east shore.
d. Paddlers assess the reach by a long paddle across Quakish Lake. This will be unacceptable once the reach is watered.
e. Owner Katahdin Forest Management may be amenable to the proposal.

**Recreations facilities improvements at specific sites -** Parking, ramp, amenities at launches

1. Chesuncook Dam Boat Launch - maintain site of, and primitive nature of launch with the following improvements: remove large boulders and improve substrate of launch to the 935.1 water

level, build a wind break on the northwest side of ramp, pay for and expand winter plowing, annual maintenance of ramp to repair erosion and ice damage.

Justification:

a. Provides safe, reliable access to project waters including public campsites
b. Enhances the safety of boats and trailers being launched. Currently there is repeated damage to these.
c. Supports commercial businesses
d. Ensures safe navigation between and within project lakes
e. Protects aesthetics of lakes and campsites
f. Ops Model Study demonstrates this as possible with minimum impact

2. Caribou Lake Boat Launch - increase parking both summer and winter, annual maintenance of ramp to repair erosion and ice damage. Maintain a usable water level of 936.7 or higher, as indicated in the Recreation Study from May 15th to the end of Labor Day weekend

Justification:

a. This is the level the boat launch is usable according to the Recreational Study
b. Provides safe, reliable access to lakes
c. Ensures safe navigation of project lakes
d. Supports commercial businesses
e. Protects aesthetics of lakes and campsites

3. Ambajejus Boat Launch/Millinocket Lake Boat Launch - Provide Adequate parking

Justification:

a. Current parking is inadequate during times of peak use: weekend and holidays.
b. Restricts access to both Ambejejus and Millinocket Lakes.
c. Appears to be within the project boundary.
d. Photos will be provided documenting the problem

Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

August 11, 2024

**Subject: Ripogenus Hydroelectric Project (FERC No. 2572-133)**
**Penobscot Mills Hydroelectric Project (FERC No. 2458-247)C**

Comments and study request supplemental to August 1, 2024 JOINT NGO STAKEHOLDER COMMENTS ON DRAFT LICENSE APPLICATION

**Dear Secretary Reese:** **Via Electronic Filing**

This filing is supplemental to the joint Stakeholder comments of August 1, 2024. My filing seeks to expand and detail fish and aquatic communities( and angler issues, only briefly or not mentioned, in the joint Stakeholder comments and attachment. These critical areas of concern were mostly ignored in the Draft License Application (DLA).

The Operations Model continues to be the cornerstone of the licensing effort. Despite the presentation of a well-done work product, this model is flawed. The lack of incorporating in-system inflow information, the use of generation as a default value, and the inclusions of theoretical spill and flood events at Ripogenus Dam makes the modeling result problematic. I continue my requests for an independent peer-reviewed water use model.

The DLA appears to duplicate the June 18, 2021 Licensee's PAD. This is disappointing. While continually repeating the theme that nothing has changed since the issuance of the 1996 FERC License, the Licensee continues to foist its opinions on Agencies, stakeholders and FERC staff by citing legal statutes, and fragmentary study results. Nothing could be further from the truth, and the Licensee needs to be forced to prove its case.

The existing License was based on Great Northen Paper (GNP) production and accompanying power demands. Hydro-generation was 24x7 and daily minimum operating flows were never considered by FERC or MeDEP; neither was lake level management as GNP needed storage to meet winter power demands. Following the "Rule Curve" was a necessity. When the Licensee assumed control of daily flow management, the existing Licensee and its "loopholes" provided an operational bonanza not foreseen by those of us involved in the 1991-1996 Licensing event. The current mode of operation has been an environmental disaster. Fish, aquatic communities, and angling have all suffered. The separate Ripogenus and Penobscot Mills Projects relicensing events offer the agencies a chance to correct past unforeseeable errors

The most salient issue that demonstrates the degradation of the Ripogenus Project is the Ripogenus Impoundment's earlier and extreme drawdown that resulted in the expatriation of Lake whitefish. With the change in ownership, operations shifted from the gradual drawdown of the Great Northen Paper era to the current generate and drain mode of storage management. Lake Whitefish are a species of priority to Maine Department of Inland Fisheries and Wildlife (MeDIFW). Some form of remediation is needed. Several possibilities exist. One being hoping for a small relic population e.g., a handful of adult fish, which might repopulate the Chesuncook basin if suitable lake elevations e.g., 936 ft, were present in

November. The MeDIFW comments "MeDIFW believes that changes in water level management may be the of reason for these declines" (1991 Rip Application) and August 1, 2024 echoed these thoughts.

Central to the Ripogenus Project (Project) issues are fish and aquatic communities of the Ripogenus Impoundment. Juvenile fish (namely smelt), insects, and plankton populations feed not only the impoundment's fish communities but also the fish populations downstream West Branch of the Penobscot River (West Branch). This aquatic biological interaction cannot be understated. What happens in Ripogenus happens in the West Branch.

Landlocked salmon (salmon) are the principal Ripogenus Project sport fish. Salmon, as sub-adult and adults are dependent on Rainbow smelt (smelt) and favor juvenile smelt. Based on MeDIFW's 2020-2023 Ripogenus Impoundment salmon stomach analysis and GNP samples (see 1991 Application), smelt less than four an half inches are exclusively utilized as forage by salmon. Larger smelt are not useful to the Project's salmon populations. Without the presence of an abundant juvenile smelt population, the impoundment and downstream salmon population will continue to fail to meet MeDIFW management goals.

Currently there is extremely limited information on the current Ripogenus Impoundment smelt population. This information is from MeDIFW's limited 2021 time-available smelt drift net collections downstream of McKay Station. When compared to the historical 26,000 pound (1983-1988) annual average, this 2021 study collected a dismal few smelt. As a result of poor juvenile smelt production and export during the last 20 years impoundment and riverine salmon growth has declined (see accession numbers 20230929-5100 and 20240719-5207 and 2023 fish assemblage studies). Information on the status of the Ripogenus Impoundment juvenile smelt population as reflected by West Branch smelt "drift" is needed. FERC should request smelt collections, presumably through (yearlong) weekly West Branch drift net sampling.

The status of Ripogenus Impoundment plankton and macroinvertebrate communities has been overlooked by the Licensee and in the resulting DLA. These guilds that are dependent on littoral areas and juvenile smelt are dependent on zooplankton abundance as a food source. Lost or shifts in littoral areas have impacted plankton communities and shifted the age structure of the impoundment's smelt population (see fish assemblage study). Although smelt have been occasionally observed in early May, small juvenile smelt are no longer observed floating down the West Branch or washed up on the shore of the Big Eddy. As a result, West Branch salmon no longer meet the 18 inch average length reported in the 1996 EIS.

In addition to the lack of juvenile smelt, aquatic macro invertebrates are no longer providing a food source to West Branch salmonids at historical levels (see Appendix C, Table 5.2.30). Mayfly hatches were sparse/non existent in mid river areas during late May, and caddis hatches were reduced during June and July (personal observations). As noted in earlier filing, aquatic insects (namely caddis flies) provide a critical summer maintenance diet to sub adult and adult salmon. Aquatic macro invertebrates are vulnerable to sudden shifts in flow as well as low flow events that constrict aquatic habitats. Higher McKay Station minimum operating flows may be required, additional habitat-based flow studies are needed.

The combination of a shift in market driven power production that along with the Project lake level management, caused a loss of smelt drift and the resultant poor salmon growth. This is reflected in the reduction in West Branch angler use. Historically (1973 – 1991) angling effort extended from the Abol

Bridge Campground upstream to McKay Station. Peak angler use exceeded 7,000 angler days in 1985 and again in 1988 (Ripogenus Project Application Vol II Table E3.1-4). Current West Branch angler effort is limited and concentrated to the upper mile and a half of river (personal observations) with the exception being Nesowadenhunk Falls. Angling is a form of recreation. However, in several "recreation surveys" anglers and angler effort were effectively ignored. The lack of a person (survey clerk) to perform on-site interviews results in a major data void. The impact on fishing opportunity as flows dramatically rise and fall has reduced fishability, namely the ability to wade. Angling is a designated use. Fishing effort, catch, and access must be described and then restored to their historical levels.

While the joint Stakeholder's filing encompassed most boating issues, there was no mention of West Branch anglers who fish from watercraft. Low McKay flows impact launching and loading canoes, boats, and large float tubes. Most notable of these access problems are loading and unloading relatively heavy Drift boats, an angling method used by West Branch guides when fishing the Big Eddy -Little A, and Horserace reaches. However, any watercraft user, motorized or not, will find launching and loading a boat, canoe or float tube at Little Ambejackmockamus and Nesowadenhunk Deadwaters and the site a half mile below Nesowadenhunk Stream impossible as flows approach 1800 cfs.

The August 1, 2024 filing speaks of flows but generally in terms of boating needs. Boating, aquatic and fish communities' flow goals are generally compatible, and request for short term releases e.g., kayaking, are no different than occasional historical flow "bumps". However, while boaters do not need daylong flows, macroinvertebrate and fish communities require 24x7 protection. Therefore, minimum operating (when power is being generated) flows are required to protect immobile aquatic insects and juvenile fish, namely salmonids. There is no need for additional studies, as historic (GNP) baseflow of 2400 cfs are known to protect all aquatic resources.

The current license includes two somewhat arbitrary West Branch flow requirements. The spawning and incubation flow based Is on an ABF recommendation of 1422 and includes provisions for low fall inflows. Outage flows of more than three days in duration are either the 1991 License application suggested 1300 cfs, or the current 1000cfs flow that is based solely on turbine efficiency. Neither of these requirements are based on empirical data. The spawning and incubation flow requirements or goals are linked to storage and inflows in early November. However, these somewhat random flow prescriptions fail to consider the redd's ability to meet late winter (salmonid) incubation flow goals. At issue, and totally overlooked, is the suitability of potential spawning areas at these lower flows. Substrate(s) (gravel, cobble) depths and upwelling flows need to be identified and their location noted. The ability of these redds, at yet to be discovered spawning sites, to survive super-cooled flows (anchor ice) during the winter needs to be investigated. Low West Branch winer flows need to be addressed through on-site studies.

The recently conducted ramping study was an example of the Licensee' s continuing effort to obfuscate facts. While the Licensee's consultant performed in a well-organized and professional manner, the study design doomed the outcome. Aquatic insects are known to be vulnerable to sudden flow changes. There was no attempt to collect drifting aquatic insects before, during and flows were return to normal. This was a major mistake. Shutting down two McKay Units is not a gradual, staged shutdown over a defined (30-60 minute) time period. What I learned from my assigned site above Little A Falls was that it took approximately 75 minutes for a rapid change in pool elevation to occur. I also saw dead and stranded salmon and aquatic insects (stoneflies were the most visible) but that was not new information. An additional study will only kill more juvenile fish, (and) aquatic insects; boating and fishing opportunities with little gain. I suggest that FERC staff simply recommend a ramping rate, perhaps 25% every hour.

The DLA continues to boast of the North Twin salmon spawning tributary access results. This study, while well executed and presented, was essentially a duplication of GNP earlier efforts, albeit ignoring MeDIFW's request for radio tagging. The tributary study was conducted without any proof of salmon being present before, during or after spawning activity . Shore spawning was addressed in what can be best described as a "desk top study". The few Redds location in the lower section of Nahmakanta Strem were from an unknown source. The Licensee is again attempting to gas light the readers; "*a telemetry study is not necessary to establish the timing of or location of spawning areas, as the timing and location of landlocked salmon spawning.....*" (Responses to Comments on the USR July 30. 2024). Where did the fish originate and where did they go? I ask that FERC require a radio telemetry with 30 adult salmon from each of the Pemadumcook and South Twin basins.

The current FERC Licensee is more energy generating friendly than any new Licensee. For this reason, the Licensee is in no hurry to obtain a new licensee. The ongoing licensing process is likely to continue for another two to three years; post licensing studies even longer. Ongoing studies have been at the Licensee's control with study execution malleable. Some independent oversight is needed. I continue to urge FERC to require the Licensee to provide funding to MeDIFW for a full-time staff position dedicated to current needs i.e., smelt drift net collection data and angler surveys, as well as future licensing needs.

The Fish and aquatic communities of the Ripogenus Project need to be returned to the 1996 levels. Currently, little in-situ biological information on lake dwelling smelt and plankton and riverine angler use is available. This paucity of aquatic data and angler use needs to be addressed. Thank you for providing me with the opportunity to expand the initial stakeholder comments and requests along with raising several issues not previously mentioned.

Ed Spear

307 Mt Hope Ave.
Bangor, Me 04401
Email; edspear1@yahoo.com
Cell: 207-217-4288

August 16, 2024

Ms. Debbie-Anne Reese
Acting Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Via online submission to: http://www/ferc.gov**

Subject: **Follow-on NGO Requests for Ops Model Runs for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458)**

Dear Acting Secretary Reese:

American Whitewater, the Appalachian Mountain Club, Caribou and Chesuncook Lake Camp Associations, Allagash Gateway Campground, Andre Emerson Cushing Corporation and Maine Council of Trout Unlimited ("NGOs" or "signatories") submit this follow-on request for Ops Model runs in response to the Great Lakes Hydro America, LLC ("Brookfield") letter dated February 5, 2024, Subject: Ripogenus Hydroelectric Project (FERC No. 2572-133) Penobscot Mills Hydroelectric Project (FERC No. 2458-247) Operations Model Technical Workshop Follow-up. Per discussions at the Ops Model Meeting held in Bangor on July 10, 2024, we believe that this represents a timely submission.

**Background.**

NGOs previously submitted their joint request for Ops Model Runs by their letter dated March 5, 2024. The requests represented the major user groups and stakeholders of the river and lakes, including fishermen and women on both the lakes and rivers, whitewater boaters, hikers, canoeists, campers at public campsites, and camp owners. We asked that special consideration be given to these requests. Brookfield chose not to run all the requests. The NGOs have been working as a unified group to refine our original request to better support user needs, the requirements of the Federal Power Act, and the requirements of applicable Maine environmental statutes.

**Model Run Requests.**

The model runs specified in Attachment A need to be run to cover a wider range of options than Brookfield has allowed. Our analysis leads us to believe the parameters we have developed to define these runs are feasible. These runs are essential to understanding the full range of feasible operating parameters for the projects. Once the results of these runs have been obtained, the NGOs will be able to refine the features they wish to be included in the new license beyond those listed in their Draft License Application (DLA) Comments.

**Issues.**

Lake Level. A basic conflict remains regarding what is the maximum fill level that should be permitted for an Ops Model run. Brookfield maintains that this should be 939 feet. Brookfield's justification for the lower fill level centers around flood control. They have not supported it with data. The burden is on Brookfield to justify their position, and the signatories assert that if Brookfield intends to maintain this stance that they must provide an engineering study, formal risk assessment, emergency cction plan, or other documentation that demonstrates what remains an uncorroborated assertion.

The NGO maintain that 941.6 feet is the actual fill limit of Ripogenus – Chesuncook – Caribou Lake. This is supported by:

1. Any map published within the last 100 years that shows the lake elevation as 942 feet.
2. That 941.6 is the level specified in the current license.
3. Brookfield's own signage at the McKay Station shows the "NORMAL HIGH WATER" elevation as 941.59 feet. The sign used to be located near the powerhouse but has been moved to the upper parking area. Photo 1 is a partial image of the sign. Please note that the top of the intake structure is a foot higher.
4. Data Brookfield submitted shows that on most years, it has filled the lake to over 939 feet. Operations data from 2010-2022 shows lake elevation on May 15th at 940 asl or above every year except 2012, 2013, 2015, 2016 and 2021.[1]

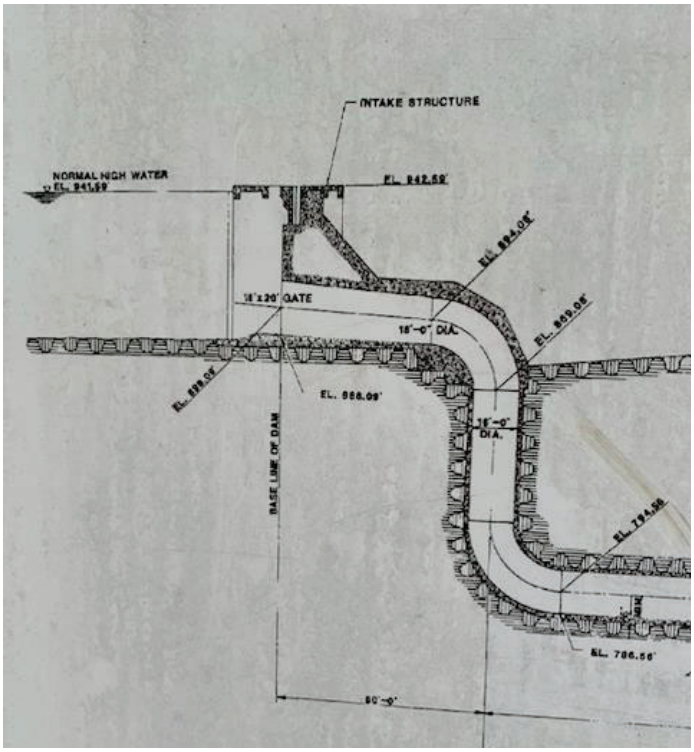



Photo 1

5. Those who have known Ripogenus – Chesuncook – Caribou Lake over the years know that Great Northern Paper filled the lake fully for years without incident. Attachment B is an affidavit attesting to that fact. The NGOs expect that more affidavits will be executed in the upcoming weeks and months with similar content.

This request gives some leeway and requests that the fill height of 940.6 feet be used for the spring fill height.

[1] Hourly Operations Data (2000-2022) filed electronically in MS Excel format) (Supplement to the Historic Operations Data Assessment Study Report filed as Appendix A of the April 22, 2023 Initial Study Report.

Accurate baseline data: Target elevations for the lakes above Ripogenus Dam as listed in the Operations Model Study are 939 on both May 10 and July 1, yet in all of Baseline 3 models the elevation is 937 and 937.2 for May and June, and 935. 1 for July. These numbers are claimed to be the average elevations from 1999-2021. This is yet another misuse of mathematical data. Averages are used when there are no outliers. Median is the more accurate measurement to use when a data set has outliers, as impoundment elevations most certainly do. Using data from 2000 - 2022 provided by the applicant, the median lake elevation on May 15 is 939.78, on June 939.44 and on July 1, 938.28. These differences are significant and serve to skew data. We request that Baseline 3 be modified with accurate data.

From Operations Study[2]

| | |
|---|---|
| May 10 | 939 |
| Jul 1 | 939 |

From Operations Model Baseline 3[3]

| | |
|---|---|
| May | 937.0 |
| June | 937.2 |
| July | 935.1 |

Overall Accuracy of the Ops Model. Inconsistencies like the one noted above continue to erode confidence in the Ops Model. After using words like calibration and validation during the Ops Model Workshop, Brookfield subsequently revised the key model feature: effects of flow regimes from McKay Station on lake levels on Ripogenus – Chesuncook – Caribou. Lack of a flow gage on the West Branch below McKay Station requires that a number of assumptions must be made regarding this complex river system. Prior concerns stated by NGOs and individuals regarding the accuracy of the model remain a matter of record.

Minimum flow. 1422 cfs is the spawning and incubation flow specified in the current license, and a preliminary analysis of the Ramping Study indicates that this may be a safe flow. Until Brookfield can produce data showing lower flows do not cause significant stranding and mortality, this is the flow that should be used as a minimum, and this is reflected in our Ops Model run request. The Ramping Study (results currently unpublished) shows that there is stranding and mortality at 1000 cfs. The dead brook trout in Photo 2 taken by volunteer Team 2 on July 17, 2024 illustrates this; over 40 stranded fish were photographed across from the McKay Station discharge that would have died if the 1000 cfs study flow had been allowed to persist. The Stranding Study conducted in October of 2022 conclusively demonstrated that extensive stranding and mortality occur during generator trip events that drop flows to 500 cfs.



Photo 2

[2] Operations Model Study of 2023, Appendix B, Ripogenus Target Elevation Curve, Table 5.5, pages 54 and Appendix A, page 66.

[3] Operations Model Logic and Validation Report 2024, Appendix B93; Operations Model Study Report, page 56, Table 2 with explanation on page 13.

Cold water flow through upper Ripogenus Gorge. Brookfield rejected the request for an Ops Model run for "Release of a minimum flow of 300 cfs through the deep gates except during periods when overflow would put 300 cfs into the upper gorge."[4] Based on further analysis, the NGOs have changed this request to 350 cfs. It should be noted that this request is subtractive. Example: if the whitewater minimum flow was 2400 cfs, 2050 cfs would be released through the generators, 350 cfs from a cold-water source, see remarks below regarding costs. For this reason, it should be assumed to be feasible. Required total whitewater flows would not be affected by this request.

**Additional concerns**

Ramping. Ramping should be implemented in the new license to decrease stranding and mortality per MDIFW guidance: "Changes in hourly rates of flow in the West Branch of the Penobscot River downstream of the Ripogenus Project to be limited to no more than 25%."[5] The NGOs do not see this as needing to be reflected in Ops Model run requests.

**Conclusion**

The signatories appreciate the opportunity to submit this request and trust that it will be run as requested.

Respectfully submitted,

American Whitewater
Bob Nasdor
Northeast Stewardship & Legal Director

Maine Council of Trout Unlimited
Stephen G. Heinz
Maine TU Council FERC Coordinator

Appalachian Mountain Club
Mark Zakutansky
Director of Conservation Policy Engagement

Allagash Gateway Campground
Andre Emerson Cushing Corporation
Benjamin Worrell
Legal Council

Caribou and Chesuncook Lake Camp Associations
Bill Houston
Spokesperson

[4] NGO letter of March 5, 2024, Subject NGO Requests for Ops Model Runs for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458).
[5] MDIFW DLA Comments dated August 1, 2024, page 2.

ATTACHMENTS:

A - Joint Ops Model Run Request

B - Affidavit of Mr. William Cushing

**Attachment A**

# Requests for Additional Operations Model Runs

## Lake Level Scenario Requests

**Request 1:**

This is a slight modification of what was titled Scenario No. 3 in the first model runs.
***We request it be rerun using 940.1 as full pond.****

- **Ripogenus Lake Elevation:**
  - Target Lake Elevations
    - 5/15 940.1
    - 6/1 940.1
    - 7/1 939.1
    - 8/1 938.1
    - 9/1 937.1
    - 10/1 936.1
    - 10/15 935.6

* Note: Changes from Scenario 3 are indicated by ***bold italics text***.

- **North Twin Lake Elevation:**
  - Winter drawdown Target Elevation 482.0 on 4/1
  - Target Lake Elevations:
    - 1/1 483.0
    - 2/1 483.0
    - 3/1 482.0
    - 4/1 482.0
    - 5/1 488.7
    - 5/10 490.4
    - 6/1 490.4
    - 7/1 490.4
    - 8/1 489.9
    - 9/1 489.0
    - 10/1 488.6
    - 11/1 486.0
    - 12/1 484.0
    -
- **North Twin Minimum Flow Request 1 (included in Scenario 1):**
  - From 8/22 – 10/15 provide a flow of 3,000 cfs as long as North Twin elevation is >488.42 feet and Ripogenus Lake elevation meets above criteria; otherwise, provide 1,500 cfs during this period and remainder of year.

**Request 2:**

- **Ripogenus Lake Level Elevation:**
  - Same as Request 1 but with a ***maximum winter drawdown not to exceed 925.***

**Request 3:**

**North Twin Minimum Flow Request 2. Includes all elements of Request 1:**

- From 8/22 – 10/15 provide a minimum flow of 3,000 cfs as long as North Twin elevation is >488.42 feet and Ripogenus Lake elevation meets above criteria; otherwise, ***provide 2,000 cfs during this period and remainder of year.***

## Fisheries/Habitat Flow Requests

**Request 4:**

Provide ***350 cfs cold water flow in the Upper Gorge 24/7/365***. This flow would also be subtractive as explained above.

**Request 5:**

Establish a ***minimum flow of 1422 cfs below McKay Station 24/7/365*.**

Previous NGO requests already include resources of interest, anticipated benefits, and success/benefit metrics so for the sake of brevity, they are not duplicated here.

Please see previous NGO Ops Model Requests as needed.

# Attachment B

August 2, 2024

Debbie-Anne A. Reese
Acting Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Dear Acting Secretary Reese:

My name is William Cushing and the connection I have with the Ripogenous Impoundment is both profound and enduring. My love for the Ripogenous rooted deeply in my formative years and has extended into my adult life. During my childhood, between 1964 and 1980, I spent every weekend and nearly every day during summer exploring our family property bordering the impoundment. I vividly remember the winters with partially heavy snowfalls, as my father made sure I took an active role in maintaining the snow-laden property. This land was not just a place of leisure but a significant part of my upbringing. In those days, the impoundment always reached full pond elevation.

A crucial detail in my memories from that time is the Ripogenous' water levels. I remember one day; while exploring as a child, my grandfather showed me where the gage was located and how it was used to measure the impoundment's water level. Typically, after the winter snow melted and as the season transitioned into spring, the Ripogenous would typically reach the high-water mark of 941.6 (944) feet with the melting snow and seasonal rain. Throughout the spring, the water level would gradually decrease by roughly a foot per month. There was almost a rhythm to the way the Ripogenous changed pond elevation.

However, upon returning to the property as an adult in 2005/2006, I noticed significant changes in the behavior of the impoundment's water levels. The once predictable drawdown was no longer present. Instead, the water levels fluctuated in ways that were unfamiliar and inconsistent with my childhood experiences.

This shift is more than a change in water levels due to climate change; it reflects a broader transformation in how the natural resources are managed and the impact of such changes on local ecosystems. Observing this transformation has deepened my appreciation for the intricate balance required to manage natural resources sustainably. It also underscores the importance of understanding historical patterns and their implications for current and future environmental stewardship.

Historically, the Ripogenous Impoundment was managed by Great Northern Paper until the sometime in the 1980s. During their management, Great Northern Paper excelled in balancing the Ripogenous' natural resources with Great Northern's business objectives. However, since that management transitioned to Great Lakes Hydro America, LLC., there has been a noticeable change in the water management practices. Most recently, it has come to my attention that Great Lakes Hydro America plans to change the Ripogenous' full pond elevation

from 941.6 (944) feet to 939 feet. The once-familiar, consistent water levels in the Ripogenous have been replaced by greater variability, affecting the natural cycle I once knew. I anticipate this will only worsen if Great Lakes Hydro America is permitted to further reduce the accepted full pond elevation of the Ripogenous.

My personal connection to the Ripogenous Impoundment has provided me with a unique perspective on the interplay between human activity and natural systems. It has also reinforced my commitment to advocating for responsible and informed management practices that honor both historical patterns and ecological integrity. As I continue to engage with this land and its changing environment, I am driven by a desire to bridge the gap between past experiences and present realities, striving to contribute to solutions that respect both heritage and sustainability.

Sincerely,

Dated: 8.2.24

William Cushing

STATE OF MAINE
PENOBSCOT, ss.

August 2, 2024

Personally appeared the above-named William Cushing and acknowledged the foregoing affidavit by him signed to be true and accurate and based on his own personal knowledge.

Before me,

Lisa Belyea

**NOTARY PUBLIC**

Print Notary name: Lisa Belyea
Notary Public, State of Maine
My Commission Expires January 12, 2029

My commission expires: _____

Ms. Debbie Anne Reese
Acting Secretary FERC
888 First Street NE
Washington, D.C. 20426

August 19, 2024

Subject: Comments on P-2572-133 Draft License Application by Brookfield/GLHA

Dear Acting Secretary Reese:

I wish to comment on statements contained in Exhibit E in the Draft License Application recently submitted by Brookfield/GLHA.

.

1. On page E-13 of Exhibit E principal features of the Ripogenus Project are enumerated including this description: “a 20.8 mile impoundment having a normal full pond elevation of 941.59 feet (ft) with a surface area of 29,270 acres”. When various iterations of flow modeling requests are described by the applicant a lower pond elevation (hence less storage capacity) is utilized. I conclude this is done primarily or exclusively for the benefit of the applicant. This is blatantly unfair to stakeholders who point to increased storage as a means of accommodating various concerns and interests expressed in this docket.

2. On Page E-24 of Exhibit E the applicant states: “The Ripogenus Project impoundment is managed on an annual cycle to dampen the variability and occasional extremes of seasonal precipitation and runoff through storage within the impoundment.“ Management of impoundments generally does what is described in that sentence; however more than occasional extremes in daily flow changes are quite common downstream from McKay Station, unfortunately coinciding with the period of the year when much of a year's growth of salmon would be occurring.

3. When describing the effects of proposed operations on riverine aquatic habitat downstream of McKay Station GLHA states: “Proposed operations would continue to maintain and promote a world class landlocked salmon fishery in the 21-mile long reach of the West Branch downstream of McKay Station.” In fact, the record contains comments from numerous individuals and stakeholders stating that the quality of the fishery has declined from historical levels. I infer that those individuals would not characterize the current state of the fishery as “world class.” Further, on page E-222, the results of raft electrofishing surveys conducted in 2022 show that the mean weight of 48 landlocked salmon classified as adults captured in those surveys was 84.4 grams. Converting to non-metric units, the average weight of salmon classified as adults in these surveys was 3 ounces. World class?

By most accounts the salmon fishery in the West Branch Penobscot River below McKay Station is a high quality fishery; however concerns that it has been diminished by current operating procedures

should not be dismissed.

Thank you for the opportunity to comment on this important matter.

Philip Hulbert
895 Brickhouse Hill Rd.
East Meredith, NY 13757

Ms. Debbie-Anne Reese August 22, 2024
Acting Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Subject: A rebuttal of Fish and Aquatic Communities Information Presented in the August 16, 2024 NGO Requests for Ops Model Runs for the Ripogenus Project (P-2572) and the Penobscot Mills Project (P-2458)**

Dear Secretary Reese,

This filing seeks to rebuke the stakeholders August 16, 2024 Ops Model request(s) that dealt with fish, (and) aquatic communities, and angling as they relate to the West Branch of the Penobscot River (West Branch) flow and to the Ripogenus Impoundment's ability to maintain higher lake elevations. This section of the stakeholder's request was not based on science, makes faulty assumptions, and provides erroneous information.

The stakeholder's Ops Model requests make an attempt to blend aquatic communities flow needs with boating flows, namely 350 cfs in the Upper Gorge. These are two separate guilds. In most cases, ramped boating flows have little or no impact on aquatic communities. While I endorse providing boaters with specified flow events, boating flows should be considered separately as FERC attempts to balance competing users.

The new Ripogenus Project license will set minimum operating and emergency flows below Ripogenus Dam and McKay Station that will last for thirty years. Soon to be produced Ops Model iterations need to be based on science rather than fiction.

I concur with the stakeholder's premise that West Branch fish and aquatic communities need protection during low flow periods i.e., flow less than 2200 cfs. However, "*Establishing 1422 cfs flow 24x7x365"* Ops Model request is simply not based on science. Furthermore, this is the wrong time frame to make definitive claims regarding license prescriptions. The 1996 License 1422 cfs spawning and incubation flow prescription was unproven then and remains unproven now. During the biologically active May 1 to

October 15 period, the flow goal is to protect aquatic insects living on and under the substrates; not eggs buried in four to eight inches of gravel. Any attempt to prescribe spawning and incubation flows for the biologically active May 1 to October 15 period is not based on science and is simply a guess. This stakeholder request, as presented, fails to consider fish and aquatic community needs during this biologically critical period.

In the strongest possible language, I object to the use of "1422 cfs" as a possible biologically active season operating minimum flow, and it should be stricken from any model run. Determining a minimum operating flow during the biologically active season will be a cornerstone of any new FERC License. Dewatering almost half the river is not the answer.

The stakeholder's 1422 cfs request is based on facts not in evidence. It was simply one lay person's opinion and makes no biological sense. The recently conducted ramping study is based on flow change over time, and has NOTHING to do with the amount of aquatic habitat available at various flows. The stakeholder's make an apple to oranges comparison that should be ignored. Sadly, there is little or no information on aquatic macroinvertebrates' habitat at lower flows and to suggest otherwise is grossly misleading.

Finally, any reference to 1422 cfs ignores a major user group. Many West Branch anglers fish from drift boats, mostly on guided trips. At flows below 2200 cfs launching and more importantly, loading watercrafts, namely relatively heavy drift boats becomes either difficult or impossible. Ironically this low operating flow suggestion further reduces a group (anglers) usage they claim to be protecting. `

The stakeholder's request includes "Provide **350 cfs cold water flow in the Upper Gorge 24/7/365".** While this request is acceptable as a boating flow iteration it should not be a fisheries issue. Flows greater than 200 cfs "flies in the face of MeDIFW" goal of 100 cfs (August 1, 2024, filing). As this flow request relates to fisheries, a 365 cfs flow results in losses to salmonid habitat and fishing opportunity. Flows of between 100 and 200 cfs maximize (juvenile) salmonid habitats and fishing opportunity (Ripogenus License Application pages 280 and 283). To repeat again, periodic ramped boating releases, if done mid-day, will have no significant impacts on fisheries goals.

The reference to "24x7x365" cold water is misleading and ignores limnology and physics. The period when cold water is needed is approximately the June 15-September 15 period, and that flow should be, as MeDIFW requested, through a deep gate. Additionally, the area of available Ripogenus Lake hypolimnion water is limited to the approximate ten-foot band between the base of the intake structure and the base of the deep gate, and the 500-750 acres of Ripogenus lake deep water. The supply of "cold water" is very limited. Limnological data can be found in the Big A Project Application (P-3779). Perhaps the Licensee can find this datum and make it available and the volume of Ripogenus Lake's cold/cool water determined.

In prior stakeholder filings there have been multiple ramping requests. FERC will very likely require ramping as a License condition. The recent Ops Model requests failed to mention up and down ramping of the proposed boating flows. While a final ramping prescription is not available, potential ramping requirements will increase the loss of impoundment (Ripogenus, North Twin or Quakish) storage by an additional 50-100% (depending on the rate chosen) for a four-hour boating flow event. Ops Model runs should account for ramping requirements.

In a continuation of my effort to correct the record, photo two is misleading. The pictures of trapped salmonids refer to trout and this is incorrect. Clearly the smaller fish is a landlocked salmon fry. The resolution of the second fish pictured makes identification impossible.

In their Ripogenus Dam boating flow releases Ops Model run requests, the stakeholder failed to mention how the flows would be delivered to the Upper Gorge. The reader is left guessing the source of water, warm log sluice water, or cooler deep gate water. Both methods lead to other issues. A cold-water deep gate withdrawal reduces the already stressed volume of cold/cooler Rip Impoundment water. A log sluice or warm water withdrawal adds a thermal factor to the equation. The stakeholders should consult with MeDIFW and clarify this question: hot or cold?

I ask the Licensee to disregard the stakeholders Ops Model run request of 1422 cfs as it relates to the biologically active period beginning on May 1 and continuing through October 15. I request that the referenced Ops Model run flow be set at 2000 cfs, a flow that closely parallels the historical Great Northen Paper (GNP) operations. Historical GNP flows are known to support aquatic macroinvertebrates populations as well as a world class West Branch landlocked salmon population. Ramping should be applied to

flow changes, "MeDIFW *recommends changes in hourly rates of flow in the West Branch of the Penobscot River downstream of the Ripogenus Project to be limited to no more than 25%."* (August 1, 2024). Other possible ramping prescriptions exists.

Thank you for the opportunity to correct the record. It is my hope that the Licensee and FERC staff will give serious considerations to my comments and requests.

Ed Spear

307 Mt Hope Ave.
Bangor, Me 04402
Email: edspear1@yahoo.com
Phone: 207-217-4288

On the evening of August 21, 2024, the Mckay/Ripogenus total flow went down to 1,000 cfs (as was noted on the Safe Waters website and was witnessed first hand as I work at Big Eddy Campground, located downstream of Mckay.) Later in the evening it was scheduled to return to 1,800 - 2,000 cfs. I did not see this increase because I had retired inside for the evening. The following morning, August 22, I was talking to a seasonal camper who was out fishing the night before. He was wading about thigh deep in front of his campsite during the low flow of 1,000 cfs. Very quickly and all of a sudden the water rose and it was up to his abdomen. He hurriedly had to retreat to shore in order to avoid being overtaken by the increase in flow. There was no warning via a siren. Nothing.

This is not the first time this summer that the river flow has increased dramatically and no siren is given letting the public know that a change in flow is occurring. This is a huge safety concern. I don't believe I need to explain the potential risk outcomes due to this negligence.

Please return to the practice of sounding the alarm when the river flow increases significantly.

9/3/24

Debbie-Anne A. Reese, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Subject: Ripogenus Hydroelectric Project (FERC No. 2572-133) Updated Study Report comments.**

Dear Secretary Reese,

The following comments are in regard to the follow up release of the raw data of User Surveys in the Updated Study Report (USR) for Ripogenus Project (P-2572-133) submitted on behalf of members of the Caribou Chesuncook Lake Camp Associations.

As we noted in a previous filing, all surveys completed by camp owners and users of the remote campsite were not included in the final results. The raw data has been released, but to date there have not been any summaries to include the results of the excluded surveys. Given that the data is extremely difficult to read in the raw form, I have organized and collated the comments for easy reading and interpreting. We know FERC representatives are extremely busy and thought this format might be helpful.

39 surveys were completed for the **Caribou Lake Boat Launch**

Comments included:

- With the drought condition and excessive water releases I am afraid we have lost some of our fish and loon populations.
- This year the lake level has been great and I am able to swim, use a boat, and get into Chesuncook lake by boat. Swimming is much easier not having to walk across a boulder field. I hope that levels will remain up at a reasonable level for the summer
- The Caribou Lake water level this summer (2022) is great. There is safe access to the lake by boat/canoe and for swimming. Last summer (2021) due to the water level being so low we were unable to launch a boat or access the lake for any form of recreation.
- We have owned property on Caribou Lake since 1988. We have spent countless hours fishing, canoeing, boating, swimming, picnicking, hiking, hunting, snowshoeing etc. with our family over the years. We are deeply concerned because current dam management evidences a severe lack of respect for the rights and interest of property owners such as ourselves; it also is lacking

attentiveness to water quality and practices which support essential environmental requirements of fisheries and wildlife. We have seen first-hand the detrimental impacts of extreme variability in lake levels with severe low water resulting in loss of extensive mussel beds, decreased loon nesting sites, diminished trout/salmon feeder fish habitat, decreased habitat for ducks, geese, etc. Increased temperature rotting vegetation=decreased available oxygen and decreased water quality. Extreme low water levels due to poor dam management a major factor. We have measured a decade or more than 1/10 mile from the "high water" mark at the edge of our property, to the "low" level as early as June 1, many times! A lake such as Caribou, and Chesuncook is measured by more than the megawatts generated by the turbines at Ripogenus-Its quality and value are calculated by measures more stringent than cfs. Ask those of us who live there: When water quality suffers, we all pay a price. We used to drink the water in this lake- we don't anymore.

- Only that we are the third generation at our camp, which was the first built on Caribou Lake in 1964. So we've seen the evolution of the water level issue, and have no doubt it has gotten worse in the last 10-20 years.
- I own land and a camp on Caribou Lake, water levels for the past several years have been so low we have been unable to use my dock or launch our boat at my personally owned boat launch on Caribou Lake. Additionally access to McKay station area has been very restrictive over the past few years.
- I have spent annual spring summer and fall vacations on Caribou Lake my whole life. (43yrs) my parents bought our camp in 1981 while it was on leased land, they now own the small lot. This area means a lot to me. I have and still do enjoy boating, fishing, hiking, hunting grouse and woodcock, swimming, paddling, walking the dogs, and sightseeing. We have an amazing view of Katahdin from our cabin. The waterfront camp is an amazing place to unplug, relax, and explore nature at its finest! Please consider the camp owners while maintaining access and water levels on Caribou/Chesuncook Lake!

Liked least at the **Caribou Boat Launch** include:

- Boat launch could be better
- The inability to access the lake due to low water levels
- Rocky boat launch
- The water level is being run down far too quickly to allow for support of balanced usage and water quality in Caribou/Chesuncook lakes, as well as impacts noted above. Rocks and shallow areas are silted, with large expanses of vegetation growing in areas exposed by extensive drawdown early in the season, previous years, now flooded by high water earlier this year (see note about Ragged Lake) resulting in rotting algae and silt covered plant growth/weeds. The stench is noticeable on hot days. Swimming and wading is unpleasant when this residue is left on our skin. Further, the impact of both increased temp, and depletion of

available oxygen for aquatic life caused by decomposing organics is detrimentally affecting water quality.
- Water too low to swim
- Unreliable boat launch capacity.
- too many rocks making it difficult to launch boat due low water...
- The only thing I can think of is having more parking for truck and trailer.
- Putting my boat in
- Not well maintained…
- Dealing with boat launching and swimming access challenging due to low water levels.
- Water level of lake could be higher. The beaches were longer than other years.
- In the year 2020 and 2021 the lake was too low, this year 2022 the lake was normal high
- Getting the boat in and out of the water.
- This should not be considered a boat launch for fishing
- Water Level
- The abnormal water level
- No bathroom/ outhouse

62 surveys were completed for the **Chesuncook Dam Boat Launch**

Comments included:

- The lake levels need to be monitored better and not such a draw down. It makes things very difficult…. different hazard
- Please keep Chesuncook lake filled with water!
- Nice to see water level back to normal levels as in the past
- Lake drawdowns are extreme. The dewatering of the Ripogenus watershed are a gross display of dam mismanagement. There needs to be updated studies on the lakes needs recreational needs, camp owner's needs, environmental impacts of such extreme drawdowns of the impoundment on the ecosystems of the connecting bodies of water. Remote campsite access during these extreme drawdowns is very dangerous and borderline not worth attempting a trip. The scenic views during these drawdowns resembles the landscape of mars (this is not a compliment). The wildlife that relies on the impoundments water for sustenance is driven away to find another source (moose, loons, deer, lynx, bobcat, ect) New studies and hard critical evidence of the lake need to be done.
- I am a fly fisherman and really want to see salmon fishing remain both a Maine tradition and a lucrative opportunity for folks in this region. I hope that damn releases can be used to support a healthy population in the west branch. Also, as a user of Chesuncook and waterways upstream, I hate to see the massive withdrawals of water from this ecosystem. The water levels of Chesuncook have been massive in recent years and this has to have an impact on fish species, and as a result all species that thrive on water and fish for a living. I think that the

fishery can be a good representation of a healthy environment, and pushing that to the limit for the sake of increasing energy output is shortsighted and doesn't see how this will impact Maine in the future.

- Our family has had a lease by the ranger's camp since 1953 I have never seen the lake as low as it was last year. The boat ramp was so bad I stopped bringing my power boat after the second trip. I hope this doesn't continue to happen. Please keep it up at a decent level for the summer months.
- The recreational opportunities for visitors to the lake and my fellow lease holders are greatly diminished by the low water levels that we have seen in the past few years in the late summer and fall.
- it is much easier to access the lake when the water is higher
- Please maintain public access and good quality to this lake!
- Please keep the lake full. having the lake full or near full makes it much safer to be on summer and winter. if they choose to keep these water low, I will go elsewhere.
- Water level
- Please improve the boat launch on Chesuncook and keep the lake level up.
- I do fish the West Branch and I have fished there when the water was extremely low exposing a lot of the river bottom and seen pools of small fish trapped and just waiting to die.
- The third largest lake in Maine should have a safe and reasonably usable boat launch. It would be fairly easy to put in protection from the wind (rock barrier) and a small dock to tie up to while parking your vehicle or loading, unloading the boat and for older folks to get in or out of the boat safely.
- Please preserve water levels in lakes for the good of all.
- This is an area that is extremely important to me and a favorite spot to visit with friends and family. Chesuncook Lake needs to remain adequately filled throughout the year to remain a recreation gem for boaters, anglers, and more.
- Fill Lakes
- We have been going to this area regularly for 40 years, for work, and later, recreation. We've visited friends with a camp on Chesuncook lake's shore for 20 plus years- absolutely wonderful area when there's a lake, not worth it when it's 1/4 mile to the water at the boat launch and in front of the camp, and trying to boat to our favorite spots up and down the lake. Did not go at all this past year- so disappointing. Please leave water in the lake!
- I have great concerns for the sustainability of the marine life affected by the water fluctuations caused by the Ripogenus Dam. Although I am no expert, I have heard that the togue population has crashed to the point of almost being eliminated due to the lower of the lake level after the tongue spawn in the shallow waters. I have also heard that the smelt populations are also in decline due to a lack of stagnation that offers habitat to smelt prey. Smelt are a fundamental species in the overall ecosystem and a decline in smelt could result in decline in other fish species.

- The recreational opportunities would be enhanced by consistent, stable water levels during the summer recreational season so visitors can plan a trip and be certain the lake is accessible and useable.
- The Chesuncook Dam boat launch needs very significant improvement. Chesuncook lake should be filled every spring and have drawdown restrictions until the end of the recreational season at the end of September.
- Very concerned about the impact on fish and recreation that the Rip Dam management impacts. Nobody I spoke to thinks that current management cares at all about the fishery or the recreational opportunities
- The entire years of 2021 and 2022 the Lake levels were extremely low (maybe 30 feet low) making it virtually impossible to boat on the lakes and ice fishing was difficult and poor fishing.
- The lake water level this year 2022 was great but the last few years the lake was not useable due to the low water levels. It was dangerous to walk to water because of the distance over rocks
- Summer 2021 was a nightmare. Inability to access other lakes/ inability to traverse lake in spots even in canoe. Inability to draw water from lake. Really the drawdowns made the lake almost impossible to really recreate on. Brookfield's drawdowns of the lake were irresponsible as they were so extreme. The fish stocks suffered. The whole natural environment suffered. 2022 was much better however 2021 should not be allowed to occur again. There must be safeguards implemented to protect the environment and human usage of one of the most beautiful areas of our state (in our country!)
- Water levels need to be addressed.
- I enjoyed my recreational experiences at Chesuncook Lake so much more this summer than last summer (2021) when the lake was disastrously low. In 2021, it was nearly impossible to launch a boat because of the low water level at the Chesuncook Lake boat launch. I had to cancel two trips to the lake in the fall because my family couldn't put our boat in the water. The low water level of 2021 also impacted my recreational experiences once on the lake. It made navigation much more challenging, and it prevented us from exploring Caribou and Ripogenus from Chesuncook Lake. The lake is not as breathtaking when there is over half a mile of rocky, barren shorefront where there is supposed to be water. We also had to walk for 15+ minutes to get to camp from the shore in the summer of 2021, making getting water from the lake difficult and swimming more tedious. This summer, it was an entirely different recreational experience. The full lake makes it easy to put the boat in the water and on-the-water navigation is much easier. We spent a great day fishing in June on both Chesuncook and Caribou. Swimming, kayaking, and canoeing was more enjoyable when we didn't have to walk or drag boats across an endless rocky beach. Chesuncook Lake provides one of the most spectacular recreational settings in all of Maine, but the lake needs to have a certain amount of water in it for this to be true. That wasn't the case in 2021, but it was in 2022.

- Keeping the lake full, or at high levels makes for a much better time. 1. much easier to launch a boat 2. the fishing is better 3. less underwater obstacles that may damage boats and engines
- Please keep the lake levels as high as possible. Being a camp owner and contributing taxes to the state it is not fair to lower the levels to unusable levels
- Would like to see lake level stay higher during boating season, plus improve boat launch ramp
- Keep that water high!
- We own a 21 ft party boat and sometimes we don't feel comfortable to launch @ Chesuncook due to low water levels
- The lake levels are great this year. In the past it has been very hard to get to camp due to low lake levels
- Over the past few summers, the water level has been very low at Chesuncook lake
- Consistency. It seems water levels were much more consistent. Currently seems to be extremes so low makes most sites I visit and camp unusable for lake
- I just hope that the lake can be kept high and usable. Then we would come more often!

Least liked comments for the **Chesuncook Dam Boat Launch** included:

- The water levels
- The wind!
- The difficult of the boat launch. Not user friendly.
- Water level dropped over the past week
- Lake levels from 3 weeks prior have dropped a vertical of 5 ft
- The boat launch and the lake level.
- I was so happy it was a short walk down to the boat and not several hundred yards!
- gained 3ft of beach in 3 days
- Worries about water levels
- Boat landing very tricky to navigate
- The water levels
- The water levels
- road conditions/lake level
- Difficulty launching the boat
- Boat launch area and very low lake levels. Exposed shorelines.
- The boat launch experience is frustrating and hazardous depending on the wind and water level.
- Difficulty navigating low water
- lake water levels
- Lake levels in the summer of 2021 were so low they made recreating extremely difficult. Levels were much higher in 2022 which improved the experience considerably.

- Can't say it enough; Low Water
- Not being able to enjoy a fabulous part of Maine with our family like we have for many decades.
- Seeing the lake level so low
- Low water levels in the summer
- The boat landing and low lake water levels.
- The fact that there wasn't enough parking for the launch
- Water levels
- Low water levels in 2021.
- low to no water
- It's difficult to carry gear down to the water because of how rocky the boat launch is.
- Flat tire
- Chesuncook Rd. Condition
- Launch the boat
- Parking
- 4 season accessibility
- road quality getting to the boat launch

29 surveys were completed for the **Remote Campsites.**

Comments included:

- Please commit to managing the water resources in this area in a way that preserves the pristine wilderness and waterway
- These recreation opportunities are crucial resources in the north Maine woods. Maine has a long tradition of public recreation on private land. The easements that make recreation in and around Chesuncook and the West Branch are a prime example and should continue to be ? generations for years to come
- Water level was great this trip. In previous years, water levels were much lower on West Branch Penobscot, making areas difficult to navigate by canoe.
- Something must be done about the water levels on the 3 connecting lakes. Power capacity and rafting water release is too high.
- The recreational opportunities are severely impacted because of the low water levels in the Penobscot Mills Recreation Sites. There is a significant negative impact because of this. Fellow wilderness canoers and campers are upset about the loss of water in the last few years and will not promote trips in the affected areas.
- Keep the water high for best recreation!
- Lake level stay high
- We loved this Chesuncook L. We spent 5 days exploring all the Northern tributaries seeing 4 moose. However - in talking to locals + cabin owners we were appalled + disheartened that Brookfield Power has indiscriminately discharged such volume to drawn down this lake - causing 1/2-mile mud flats to shore (2020 + 2021?). Bad for wildlife + fish + recreation. Why has recreation visits been slow this year? Maybe because many are reluctant to visit not knowing what they will find. Highly suggest

Brookfield be mandated minimum discharge to be releasing. Saw the photos - shameful Greed

Least liked comments for the **Remote Campsites** included:

- The lower water level made accessing campsites and launches difficult.
- Low water levels
- Shockingly low water levels. Once you get on the river, despite checking reports, you could get stranded and have to slog (walk the boat) through many miles. This could be avoided with proper dam release management.
- Low water levels
- Chesuncook lake water is too low
- Lake levels vary year to year. This year it has been very high at Chesuncook, compared to last year's very low lake level, same as previous couple years. The varying lake levels affect erosion at the remote sites, fishing, and challenge navigation with boats.
- The fishing was lousy + no vegetation on shorelines. What Brookfield has done w/ these massive discharges is ruining this lake. They need to be watched + managed closely.

58 surveys were completed at **Other Sites.**

Comments included:

- 2020+2021 the lake level in Chesuncook lake drained below the "normal" 12'-15' each season. Particularly 2021, Chesuncook Lake was too low to even kayak to Pine Stream campsite, Canvas Dam Campsite, or to paddle around Gero Island. There were no great Blue Herons, white egrets, very few ospreys visiting in their typical coves in the northern area of the lake. Continue to promote carry in/carry out, keep Chesuncook lake high.
- The dams are drawing down the water levels too much for canoeing and fishing.
- Just concern on retaining a reasonable lake level through the end of September on Caribou Lake
- please keep the water levels high enough thru the summer so it can be enjoyed by all. People spend a lot of money to come
- Please keep lake levels more regular from season to season
- Yes, please consider the fishery when regulating water flow- it's been managed better with previous ownership so it could be done again. Consistent water flow is better for nature. Don't just think of your pocket book!!
- Lake level needs to be maintained higher
- Restore and stabilize the releases from McKay to save a valuable historic fishery
- I think the lowering of the lakes have affected the ecosystem birds and fish
- Brookfield's inability to keep the lake at an agreed 941.6 from sea level stable during the summer months i.e. May June July August makes for a devastating

long-term effects on the fishery wildlife and safety of the recreational opportunities On Ripogenus, Caribou, and Chesuncook lakes

- The old timers say the low water level of the Chesuncook lake the past couple years hurt the smelt population since the big salmon were not coughing up smelts next to the boat and their bellies were empty in the spring. When the water is low the graveyard point boat launch and dock is pretty unusable
- Having spent the past 30 years coming to the area, it is abundantly clear that recreational use above and below Rip Dam has increased and continues to, and is an important industry for the economy of the area. This means the conservation of these areas and their usability, and the voices of the people using them, are of upmost importance in planning for the future.
- Kayaking and wildlife viewing at Chesuncook Village area is excellent when water levels are high. Not as accessible if low.
- This is a treasured area, a gem for outdoor recreation of a variety of sorts. Its habitats deserve to be cared for, including the affects on downstream fisheries. It has appeared in recent years the only uses given major consideration were rafting and electricity generation!!!
- Water levels have been adversely impacted by poor dam maintenance at Ragged Lake, Seboomook Lake and Ripogenus Lake.
- Keep water levels consistent and at a sustainable height for fish and loon populations.
- Manipulation of water levels has severely impacted the environment for birds , wildlife, and fish. Lake water levels have been much lower over the past few years(not including the bridge/dam situation at Ragged Lake)
- Would hope water levels would support boating and access for camp owners.

Least liked comments for the **Other Sites** included:

- Low water levels
- The water levels
- Low water levels
- Water level in river needs to be more consistent. Severly affected the fishing
- It is a bit of a treacherous climb up slippery rocks and thru woods to access Gero Island campsite #3.
- The campsites need help. Lots of washed-out stairs and bog bridges to outhouses are in disrepair.
- Low water levels
- The water levels are not what they should be. Fishing condition has deterriorated in the last 10 years
- Water levels have been lower than levels 50+ years ago...
- Water level to low
- Roads were awful
- My most recent visit, water levels were high. Over the last few years though I've seen them lower than I ever could have imagined and not only is it unpleasant to

look at but makes recreating more difficult and dangerous. I'm not a biologist but I imagine it has negative impacts on wildlife.
- Great today, but in past years the varying levels of water in the lake and contributing river / stream
- I was most upset with the fact that the water levels could be lowered to such drastic levels that it affected the local ecology. In addition, it has become apparent that the dams are not being maintained to a level that would have prevented recent failures at Ragged, Ripogenus, and Seboomook Dams.
- This year the lake level is normal but big reductions in lake level over the past two years severely limit fishing, boating and boat access between Caribou and Chesuncook Lake.
- It was low tide at the Lake. Water level was severely low.

10 surveys were completed at **Unknown Sites.**

Comments included:

- Water flow management must improve in order to maintain the fisheries and overall ecosystem. The area survives on recreational opportunities, if these are destroyed by poor water management (fishery destruction, lake level drops exposing massive areas of shoreline in front of camps and boat landings, low river for rafting etc.) the area economy will crumble.
- The water level in Chesuncook is unpredictable. This year it is very high but last 2-3 yrs we could literally walk across from one side to the other.
- I am concerned about the lake levels.
- Family owned camp since our grandfather built it in 1964. First camp on Caribou. Concerned about water levels and mismanaged seasons for the past 15+ years.
- The level of the water right now is great. Easier boat launching. There are no exposed cribs. Years past the level was extremely low making wildlife viewing by boat nearly impossible. I've seen Chesuncook lake so low that it resembled Lake Powell and Lake Mead during their drought. Imagine the impact on the fish and tourism. People come to see our beautiful lakes and mountains. Fewer canoe adventurers came thru Chesuncook Village. The water level directly impacts fishing along with drawing in tourism.
- Do not put profits before people - keep water levels up and work out a system where water usage is measured for both power and consumer recreation as it was intended for...or propose a state takeover??

Least liked comments for the **Unknown Sites** included:

- access to the water
- Water levels
- The Golden Road is a mess!

- The thought of dead fish when the water is drained so low.
- traffic and low water

These comments clearly demonstrate how lake water levels and current boat landing conditions impact a recreational user's experience. It is our hope that these concerns will be addressed with meaningful Protection, Mitigation and Enhancement measures in the Final License Application.

Thank you for the opportunity to comment and your continued efforts to reach a balanced license.

Sincerely,

Bill Houston
Spokesperson
Caribou and Chesuncook Lake Camp Associations

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, DC 20426
September 5, 2024

OFFICE OF ENERGY PROJECTS

Project Nos. 2572-133 & 2458-247 –
Maine
Ripogenus Hydroelectric Project
Penobscot Mills Hydroelectric Project
Great Lakes Hydro America, LLC

VIA FERC SERVICE

Michael Scarzello, Licensing Manager
Great Lakes Hydro America, LLC
c/o Brookfield Renewable
399 Big Bay Road
Queensbury, New York, 12804

**Subject: Determination on Requests for Study Modifications and New Studies**

Dear Mr. Scarzello:

Pursuant to 18 C.F.R. § 5.15 of the Commission's regulations, this letter contains the determination on requests for modifications to the approved study plan and a new study for the Great Lakes Hydro America, LLC's (GLHA) Ripogenus Hydroelectric Project No. 2572-133 and the Penobscot Mills Hydroelectric Project No. 2458-247 (collectively, the "Projects"). The Projects are located on the West Branch of the Penobscot River and on Millinocket Stream in Piscataquis and Penobscot Counties, Maine. The determination is based on the study criteria set forth in section 5.9(b) and 5.15(d), (e), and (f) of the Commission's regulations, applicable law, Commission policy and practice, and the record of information.

Background

The study plan determination (SPD) for the Projects was issued on May 13, 2022, and required GLHA to conduct 24 studies, including a *Water Quality Study* comprising five components, and file an initial study report (ISR) on those studies by May 13, 2023.[1] GLHA filed the ISR on April 24, 2023, and held ISR meetings from May 2-4, 2023, to

[1] On February 17, 2023, Commission staff approved GLHA's request to modify the schedule for filing the ISR by moving the date up from May 13, 2023 to April 22, 2023. Because April 22 fell on a Saturday, GLHA timely filed the ISR on the next business day, which was April 24, 2023.

present the ISR results. On September 19, 2023, Commission staff issued a determination on the requests to modify the study plan.

On April 22, 2024, GLHA filed an updated study report (USR), and on May 3, 2024, GLHA filed a draft application to relicense the project. GLHA held USR meetings on May 15 and 16, 2024, and filed a meeting summary on May 31, 2024. On June 28, 2024, GLHA filed a supplement to the USR, which contained Operations Modelling results for 15 operational scenarios and recreation survey data from 330 recreation use surveys.

Comments

Comments on the USR, USR meeting summary, and USR supplement were filed by Edward Spear on May 1, May 9, May 23,[2] July 19, and July 29, 2024; Commission staff on June 14, 2024; American Whitewater and Appalachian Mountain Club on June 24, 2024; the Caribou Chesuncook Lake Camp Association, the Chesuncook Dam Camp Association, and the Chesuncook Village Association on June 24 and September 3, 2024; the Maine Department of Inland Fisheries & Wildlife (Maine DIFW) on June 27, 2024; George Forgette on June 27, 2024; the Maine Bureau of Parks and Lands on June 28, 2024; Maine Professional River Outfitters on June 30, 2024; and the Maine Council of Trout Unlimited on July 1, 2024. GLHA filed reply comments on July 30, 2024.

Many of the comments filed do not specifically request modifications to the approved study plan or additional studies. For example, many of the comments relate to GLHA's operations or contemplate potential protection, mitigation, and enhancement measures. In addition, some of the comments provide additional information; address elements of on-going studies; note potential effects on environmental resources; offer views regarding on-going consultation; express concern on the presentation of data and the results of the studies; or suggest methods for integrating or interpreting study results. This determination does not address such comments, but only addresses specific recommendations to modify the approved study plan or conduct new studies. Moreover, this determination does not address requests for modifications to studies that were previously requested, but not required by prior study plan determinations (e.g., Edward Spear's request for an Atlantic salmon radio-tagging study; and Edward Spear's and

[2] On February 9, 2024, in response to an operations modeling workshop held by GLHA on January 31 and February 1, 2024, Mr. Spear filed a letter requesting a landlocked salmon spawning and incubation flow study for the West Branch of the Penobscot River downstream from McKay Station (Ripogenus Project). In the February 9 filing, Mr. Spear addresses the study criteria in sections 5.9(b) and 5.15(e) of the Commission's regulations. Mr. Spear, again, requests this study in his May 23, 2024 filing, but without addressing the study criteria.

George Forgette's requests for a Ripogenus impoundment plankton and smelt study, including smelt drift through McKay Station).

Study Plan Determination

Pursuant to section 5.15(d) of the Commission's regulations, any proposal to modify a required study must be accompanied by a showing of good cause and must include a demonstration that: (1) the approved study was not conducted as provided for in the approved study plan; or (2) the study was conducted under anomalous environmental conditions or that environmental conditions have changed in a material way. As specified in section 5.15(e), requests for new information gathering or studies must include a statement explaining: (1) any material change in law or regulations. applicable to the information request; (2) why the goals and objectives of the approved study could not be met with the approved study methodology; (3) why the request was not made earlier; (4) significant changes in the project proposal or that significant new information material to the study objectives has become available; and (5) why the new study request satisfies the study criteria in section 5.9(b). In addition, as specified by section 5.15(f), any requests for new information gathering or studies in response to a USR must demonstrate extraordinary circumstances warranting approval.

As indicated in Appendix A, requests associated with one study were approved, and modifications to five other studies were not approved. Appendix A also summarizes the determination for a requested new study. The basis for these findings is explained in Appendix B (existing studies) and Appendix C (new study). Commission staff considered all study plan criteria in accordance with sections 5.9(b), 5.15(d) and (e), as well as 5.15(f) of the Commission's regulations.[3] However, only the specific study criteria relevant to the determination are referenced in Appendices B and C.

Nothing in this determination is intended, in any way, to limit any agency's proper exercise of its independent statutory authority to require additional studies.

[3] Additional time was needed to review and respond to voluminous filings; therefore, pursuant to section 5.29(f)(2) of the Commission's regulations, section 5.15(c)(6) is waived to provide the additional time needed to review and address the filings.

If you have any questions, please contact Allan Creamer at (202) 502-8365, or via email at allan.creamer@ferc.gov.

Sincerely,

for
Terry L. Turpin
Director
Office of Energy Projects

Enclosures: Appendix A – Summary of Determinations on Requested Modifications to Approved Studies and Request for a New Study

Appendix B – Staff Recommendations on Requested Modifications to Approved Studies

Appendix C – Staff Recommendation on Requested New Study

## APPENDIX A

## SUMMARY OF DETERMINATIONS ON REQUESTED MODIFICATIONS TO APPROVED STUDIES AND REQUEST FOR NEW STUDY

**Requested Study Modifications (*see* Appendix B for Discussion)**

| Study | Recommending Entity | Approved | Approved with Modifications | Not Approved |
|---|---|---|---|---|
| 1. Operations Model – cost/benefit analysis using Loomis (2000) | Maine TU [4] | | | X |
| 2. Penobscot Mills Bypass Channel Fishability/ Wadability Study | AW/AMC [5] | | | X |
| 3. Recreation Study | Maine TU | | | X |
| 4. Whitewater Boating Assessment | AW/AMC, Maine TU | X | | |
| 5. Aesthetics Study | Maine BPL, [6] AW/AMC, Camp Associations [7] | | | X |
| 6. Environmental Justice Study | AW/AMC | | | X |

[4] Maine Council of Trout Unlimited.

[5] American Whitewater and Appalachian Mountain Club.

[6] Maine Bureau of Parks and Lands.

[7] Caribou and Chesuncook Lake Camp Association, Chesuncook Village Association, and the Chesuncook Dam Camp Association.

**Requested New Study (*see* Appendix C for Discussion)**

| Study | Recommending Entity | Approved | Approved with Modifications | Not Approved |
|---|---|---|---|---|
| West Branch Flow Study – spawning/ rearing habitat downstream from McKay Station | Edward Spear | | | X |

# APPENDIX B

## STAFF RECOMMENDATIONS ON REQUESTED MODIFICATIONS TO APPROVED STUDIES

### 1. Operations Model – cost/benefit analysis using Loomis (2000)[8]

Background

Great Lakes Hydro America, LLC (GLHA) operates the Ripogenus Project as a store-and-release facility, with an annual seasonal drawdown that allows for management of water levels and flows in the downstream reaches of the West Branch and mainstem of the Penobscot River. The Ripogenus Project works in coordination with the upstream Storage Project (FERC No. 2634) and the downstream Penobscot Mills Project, which receives flows from the Ripogenus Project. GLHA operates the Ripogenus and Penobscot Mills Projects (collectively, the Projects) as a combined system using a system-wide rule curve dating back to the 1970s.

The approved study plan required GLHA to develop an operations model using the Computer Hydro Electric Operations and Planning Software (CHEOPS). GLHA developed, calibrated, and verified the model during the first year of studies and refined it during the second year of studies based on stakeholder comments on the Initial Study Report, as well as comments received during GLHA's modeling workshop held January 31 and February 1, 2024. GLHA included the refined model in the Updated Study Report (USR) and presented a summary of the model during the USR meetings on May 15 and 16, 2024. GLHA used the model to simulate elevations, on an hourly basis, for each of the Projects' impoundments under various operating constraints (i.e., minimum flows, starting impoundment levels, and hydrology). Based on stakeholder requests, GLHA modeled 15 alternative operational scenarios. GLHA filed the results on June 28, 2024, and met with the stakeholders to discuss the results on July 10, 2024.

Requested Study Modification

In its comments on the *Operations Model Study*,[9] the Maine Council of Trout Unlimited (Maine TU) asserts that the modeling results, to date, show a need for an alternative cost/benefit analysis to determine the economic benefits that would result from enhancement of environmental resources associated with individual modeling scenarios. Maine TU claims that such a valuation analysis is needed to put model results

[8] Loomis, J.B. 2000. Environmental Valuation Techniques in Water Resource Decision Making. Journal of Water Resource Planning and Management, 126(6):339.

[9] *See* Maine TU's July 1, 2024 Filing at 3-4.

in perspective, as Maine TU believes that the results are based on changes in generation at each development. To address this concern, Maine TU requests that the *Operations Model Study* be modified to include an economic cost/benefit analysis component based on Loomis (2000). The goal of the analysis would be to derive an economic value for the environmental resources affected by alternative operational scenarios (e.g., flow changes).

Comments on Requested Study Modification

In its reply comments, GLHA responded to comments received from Maine TU, American Whitewater and Appalachian Mountain Club (AW/AMC), and the Camp Associations,[10] on the *Operations Model Study*. GLHA states that the CHEOPS model is not generation driven, accurately reflects the Projects' current operations, and meets the overall goals and objectives for the model. However, GLHA did not specifically respond to Maine TU's request for an economic valuation for resources affected by alternative operational scenarios.

Discussion and Recommendation

Our assessment of the license application(s) will be done using the information gathered from the various studies conducted, or being conducted, by GLHA [section 5.9(b)(4)]. Potential beneficial and adverse effects of the various operating scenarios on environmental resources can be reasonably identified in those studies, and we will use this information to inform potential license conditions [section 5.9(b)(5)]. Moreover, we do not need to put dollar values on the environmental resources to characterize the beneficial and adverse effects of the various operational scenarios. Therefore, we do not recommend that GLHA be required to conduct cost/benefit analyses of environmental resources using Loomis (2000), as requested.

**2. Penobscot Mills Bypass Channel Fishability/Wadability Study**

Background

The approved study plan required GLHA to conduct a *Penobscot Mills Bypass Channel Fishability/Wadability Study*. The goal of the study was to evaluate conditions that affect suitable wading (e.g., water depth and velocity) and fishability under a range of flows that would support the Maine Department of Inland Fisheries & Wildlife's (Maine DIFW) fishery management interests for the West Branch downstream from Stone Dam. The study area was the West Branch, about 1 mile downstream from Stone Dam. The study used a phased approach that included an angler field assessment of three

[10] *See* n. 7 *supra*.

different flows [93, 236, 392 cubic feet per second (cfs[11])] and the existing PHABSIM (Physical Habitat Simulation) model used in the IFIM (Instream Flow Incremental Methodology) study. The model allowed GLHA to simulate conditions that affect wading conditions in, and fishability of, the reach beyond those physically experienced by the anglers during the study's field component. The details of the study's methodology are in GLHA's *Angler Flow Evaluation Study Report – West Branch Downstream of Stone Dam*.[12]

Requested Study Modifications

In its comments, AW/AMC argues that the study failed to follow the approved study methodology, in that the highest flow evaluated was 392 cfs, and flows of 420, 700, and 1,000 cfs were not evaluated, as required by the approved study plan. Moreover, AW/AMC asserts that the study arbitrarily used short casting distances and fixed wading points not reflecting the habits of experienced anglers, all of which led to unsupported conclusions about optimal angling flows. Therefore, AW/AMC requests that GLHA repeat the study following the approved methodology and coordinate with Maine TU on the implementation of the study plan.

Comments on Requested Study Modifications

In its reply comments, GLHA maintains that the study was completed in accordance with the approved study plan. GLHA states that the study evaluated angling and wadability at flows between 50 and 1,000 cfs by relying on a field component that evaluated flows released from Stone Dam and a modeling component that was used to assess fishability and wadability at higher flows. GLHA notes that the approved study plan did not require the release of 420, 700, and 1,000 cfs, but only that flows between 50 and 1,000 cfs be evaluated. GLHA also notes that none of the anglers that participated in the field component of the study, including representative of Maine DIFW and Maine TU, expressed concern in the field regarding the flows released. Instead, participants observed that a flow of 392 cfs created conditions that began to restrict their ability to comfortably wade the reach. As to casting distance, GLHA states that the distance of 30

[11] The study design contemplated a high flow of about 700 cfs. However, Stone Dam has no operable gates to control flow into the West Branch. Rather, flows pass over the spillway, which is equipped with wooden flashboards and a pneumatic dam system. To provide the mid and high flows for the angler study, the headpond elevation of Quakish Lake was increased in small increments to minimize the risk of flashboard failure, but also to spill water over the top of the flashboards. Flows were not gaged during the angler evaluation but were confirmed based on readings at a temporary staff gage installed at the study site and an established stage discharge rating curve.

[12] *See* Appendix D of GLHA's April 22, 2024 Updated Study Report.

feet was not set arbitrarily, but, rather, was the approximate average casting distance observed during the field portion of the study.

Discussion and Recommendation

The goal of the *Penobscot Mills Bypass Channel Fishability/Wadability Study* was to evaluate a range of flows that would allow safe wading and angling in the West Branch downstream from Stone Dam. The approved study plan did not identify or require specific flow releases (i.e., 420, 700, and 1,000 cfs), other than existing leakage (estimated to be between 17 and 100 cfs) and the potential for a second flow release in the range of 400 to 700 cfs. The flows of 93, 236, 392 cfs released during the field portion of the study fall within, or meet the intent of, the flow ranges approved as part of the study plan.

The field effort involved a group of anglers, of varied experience, evaluating wading conditions and fishability at leakage flow ("low;" 93 cfs), as well as two higher flows (236 and 392 cfs). The angling survey questionnaire used during the evaluation was jointly developed by GLHA and Maine DIFW, and asked anglers to rate the following: (a) ability to walk the shoreline/bank; (b) number of desirable fishing spots; (c) wadability; (d) ability to cast to desirable areas; (e) velocity of water for casting; (f) maximum depth for wading; and (g) overall impressions of the experience. Anglers also reported information on safe wading conditions, and water depth and velocity were recorded at locations the anglers reported wading becoming uncomfortable. The empirical data collected during the field effort were used to develop angler suitability metrics,[13] which were used in the PHABSIM model to evaluate angling and wading suitability at the flows experienced by anglers in the field (i.e., 93, 236, and 392 cfs), as well as flows of 50, 300, 420, 700, and 1,000 cfs. The methodology, as described above, is consistent with the approved study design.

Regarding casting distance, the approved study plan did not establish a defined casting distance to a "fish lie" or desirable angling area. Rather, the casting distance was to be calculated in the field, which was done. We understand that experienced anglers, under favorable conditions, may be able to consistently cast a line farther than 30 feet to reach a fish lie. However, limiting the casting distance to an average of 30 feet does not invalidate the study or its results regarding fishability of specific flows. Moreover, using

[13] The information collected during the angler surveys (i.e., depth and velocity limitations) were used to create a wading suitability index that was entered into the PHABSIM model to produce a weighted usable area curve for wading conditions in the study area. PHABSIM calculates suitable area across 1,000 linear feet of stream length, such that the results are "weighted" to account for the length of an entire study area.

an "average" takes into account a range of casting distances, some shorter and some longer than 30 feet, in determining fishability of any given flow.

The methodology used by GLHA is reasonable and consistent with standard and accepted flow evaluation techniques for evaluating wading and angling suitability in rivers like the West Branch [section 5.9(b)(6)], and the information obtained from this study is sufficient to inform a licensing decision for the Penobscot Mill Project [section 5.9(b)(5)]. Moreover, the study was conducted as provided for in the approved study plan [section 5.15(d)]. Therefore, we do not recommend that GLHA repeat the *Penobscot Mills Bypass Channel Fishability/Wadability Study* at higher flows, and with different (higher) average casting distances, as requested.

**3. Recreation Study**

Background

The approved study plan required GLHA to conduct a *Recreation Study*. As part of the study, GLHA was to: (1) inventory and map existing Commission-approved project recreation sites; (2) evaluate recreation use at project recreation sites; (3) conduct user surveys at the project recreation sites, and online, to assess activities (including angling), site conditions, satisfaction with existing facilities, and recommendations regarding the sites and facilities; (4) conduct qualitative interviews or focus groups to obtain information on the informal and formal recreation sites; and (5) assess the accessibility and useability of select project boat ramps (i.e., Chesuncook Dam Point Boat Launch, Caribou Lake Put-In, Millinocket Lake Boat Launch, Ambajejus Lake Boat Launch, and South Twin Lake Boat Launch) under existing drawdowns, and identify any changes that would ensure the accessibility and usability of the boat launches throughout the recreation season under the range of potential new water levels.

Requested Study Modifications

In its comments, Maine TU, AW/AMC, as well as the Camp Associations request that recreational surveys for the non-project lake campsites and the Big Eddy Campground be included in the survey report. Moreover, Maine TU requests that surveyors be deployed in the field to collect data as part of a third year of studies.

Reply Comments

In its reply comments, GLHA states that the results for all surveys (project and non-project sites) were filed with the Commission on June 28, 2024. GLHA also maintains that the *Recreation Study* was completed in accordance with the approved goals and objectives for the study. Moreover, GLHA indicates that the study results will

be evaluated in the final license application, as necessary, to inform its recreation enhancement proposal(s).

Discussion and Recommendation

The remote campsites mentioned by the commentors are not project recreation sites, are not in the project boundary, and were not required to be studied. As to study methodology, GLHA's focus group process is an acceptable approach to collect information on formal and informal recreation sites at the Projects [section 5.9(b)(6)]. During the two focus groups, GLHA presented data to the focus group participants and collected sufficient information on recreation use at the Projects' recreation sites, as well as non-project recreation sites [section 5.9(b)(4)]. All this survey data has been filed with the Commission and is sufficient to inform licensing decisions for the Projects [section 5.9(b)(5)].

Regarding the requests for additional in-person surveys, GLHA redeployed their survey kiosks during the second study season, allowing them to collect recreation data from the summer and winter recreation seasons. This allowed for more recreationists to be surveyed than in-person surveying, due to the size and remoteness of the Projects [section 5.9(b)(7)]. Moreover, the combination of focus group sessions and the redeployment of the survey kiosks provided thorough locational and topical recreation use input [section 5.9(b)(6)]. Therefore, we do not recommend that the *Recreation Study* be modified to include a third survey season with in-person surveys.

**4. Whitewater Boating Assessment**

Background

The approved study plan for the first year of studies required that GLHA conduct a *Whitewater Boating Assessment*, equivalent to a Whittaker Level 1 study,[14] using a combination of a literature review, a survey of whitewater boaters, and hydrologic analyses for four study reaches associated with the projects: (1) West Branch downstream from McKay Station to Debsconeag Falls; (2) West Branch downstream from Ripogenus Dam to McKay Station ("Upper Gorge" or "dryway"); (3) West Branch

[14] Whittaker *et al*. (2005) provides a generally accepted whitewater boating methodology that involves a phased approach consisting of three progressive levels: (1) a Level 1 desktop analysis; (2) a Level 2 on-land feasibility assessment and/or on-water single-flow feasibility assessment; and (3) a Level 3 intensive study, including multiple flows. *See* Whittaker, D., Shelby, B., and J. Gangemi. 2005. Flows and recreation: a guide to studies for river professionals. Hydropower Reform Coalition. Available at http://npshistory.com/publications/rtca/nri/flows-recreation.pdf.

downstream from Stone Dam to Shad Pond; and (4) Millinocket Stream downstream from Millinocket Lake Storage Dam. The approved study plan also recognized that, depending on the findings of the first study season, a Level 2 or Level 3 study may be needed. GLHA conducted the *Whitewater Boating Assessment* on each of the four study reaches in 2022.

The approved study plan for the second year of studies required a Level 2 study for the West Branch downstream from Stone Dam to Shad Pond.[15] We stated that a Whittaker Level 2 study for boating the West Branch downstream from Stone Dam would: (1) identify the reach's flow-dependent attributes; (2) assess the feasibility and potential quality of boating opportunities there; and (3) estimate necessary flow ranges for boating the river. Moreover, the approved study plan required that the Level 2 study include boating the reach to "Assess the feasibility and potential quality of boating opportunities and estimate flow ranges by boating the river at a single flow."[16]

Requested Study Modifications

AW/AMC and Christopher Howe assert that GLHA has not completed the Level 2 whitewater boating evaluation downstream from Stone Dam and has not held a planning meeting with AW/AMC to coordinate the study implementation. AW/AMC requests that GLHA complete this study in accordance with the approved study. In addition, Maine TU requests that the on-water portion of the Level 2 study be conducted in Summer of 2024.

Reply Comments

In its reply comments, GLHA indicates that it has scheduled a meeting with stakeholders to determine the feasibility and logistics of safely performing an on-water boating assessment in the West Branch downstream from Stone Dam. GLHA states that if a reasonable study approach can be developed that allows the study to be conducted safely, the on-water Level 2 assessment of the reach will be completed.

Discussion and Recommendation

Currently, there is no formal put-in for the reach downstream from Stone Dam. Interviewees, of which there were only two, reported paddling about 2 miles across Quakish Lake and portaging Stone Dam to gain access to the reach. Releases from Stone Dam are typically made by deflating the pneumatic dam. However, such flow releases

[15] Director of the Office of Energy Projects' September 19, 2023 Determination at B-28.

[16] For more information, please refer to Whittaker *et al*. (2005). *See* n. 14 *supra*.

for recreation boating opportunities cannot be controlled, and the exact flow would not be precise.

As stated in the September 19, 2023 Determination, a Whittaker Level 2 study is necessary to provide information on the reach's flow-dependent attributes, assess the feasibility and potential quality of boating opportunities in the reach, and assess the flow ranges needed for boating the river [section 5.9(b)(4)]. Therefore, we recommend that GLHA conduct a Level 2 study by boat in the West Branch downstream from Stone Dam, as requested and required by the approved study plan. We also recommend that the study proceed, if it can be conducted safely, and that the study be done with experienced boaters at a single flow, includes use of an appropriate evaluation form, and is followed by a focused group discussion to assess the reach's boating feasibility, flow-dependent attributes, and the potential flow ranges for boating.

## 5. Aesthetics Study

Background

The approved study plan required GLHA to conduct a study of aesthetics at the Projects. The first year of studies, based on the Bureau of Land Management's Visual Resource Management methodology, documented the scenic views, vistas, riverscapes, and other noteworthy features of the Projects from Key Observation Points (KOPs) where the Projects are frequently viewed by the public. The study was designed to augment and update existing information on the scenic and visual resources provided at the Projects. GLHA identified KOP locations,[17] conducted an initial field inventory, and photo documented aesthetic resources from the KOP locations. The approved study plan required the *Aesthetics Study* to be conducted in consultation with Maine Bureau of Parks and Lands (Maine BPL), AW/AMC, the Camp Associations, and other interested stakeholders. This consultation did not occur during the first year of studies. Instead, GLHA collected baseline photo documentation of noteworthy features and then proposed to assemble a focus group to participate in supplementing the existing information on aesthetics at the Projects. The approved study plan for the second year of studies required a virtual assessment of the KOPs by an Aesthetics Focus Group.

Proposed Study Modifications

In its comments, AW/AMC requests that the *Aesthetics Study* incorporate a dropbox or other video sharing system to host user videos and photos that can be used as part of the study. Additionally, AW/AMC states that the study should compare flows at

[17] The KOP locations were described in GLHA's Revised Study Plan filed on March 23, 2023.

different impoundment levels, and use more than one key observation point in Ripogenus Gorge. Maine BPL and Maine TU, in their comments, request that GLHA include the photos of the Ripogenus impoundment submitted by the Caribou and Chesuncook Lakes Camp Association as part of the analysis, as they believe the (low water) conditions captured in those photos better represent the conditions that boaters and campers are likely to experience. Finally, during the May 15, 2024 USR Meeting, Kathy Houston and Bob Nasdor requested that the public be allowed to view user videos of the Projects.

Reply Comments

In its reply comments, GLHA states that the goal of the *Aesthetics Study* was not to compare the effects of the seasonal drawdown of the project impoundment(s), but rather to establish a baseline assessment of the views associated with the Projects and augment existing information. GHLA asserts that there is sufficient existing information related to aesthetics.

Discussion and Recommendation

Regarding modifying the *Aesthetics Study* to include a third survey season with different impoundment levels and additional KOPs, GLHA conducted the *Aesthetics Study*, with stakeholder participation, as required by the approved study plan [section 15(d)(1)]. Based on our review of the study results, the information provided by the study is adequate to describe aesthetic conditions at the Projects under a range of operational scenarios [section 5.9(b)(4)] and analyze aesthetic issues in the environmental document and inform licensing decisions for the Projects [section 5.9(b)(5)]. Regarding requests for a drop box and including stakeholder photos and videos in the assessment, we note that photos and videos can be uploaded to the Commission's eFiling system at https://www.ferconline.ferc.gov/FERCOnline.aspx. The eFiling system accepts two types of video formats (.WMV and .MPG). Stakeholders are welcome to file any additional photos and videos into the project record for Commission staff's consideration and use in its environmental analyses. Therefore, we do not recommend modifying the *Aesthetics Study*, as requested.

**6. Environmental Justice Study**

Background

The approved study plan for the first year of studies required that the *Environmental Justice Study* be conducted in consultation with the Penobscot Indian Nation and other stakeholders. GLHA conducted the study to assess the Projects' potential to affect minority and low-income populations in the project vicinity. However,

the information in the ISR did not contain a consultation record with any stakeholders.[18] The Director's September 19, 2023, Determination required that the second year of studies include an *Environmental Justice Study* with a geographic scope of 5 miles, instead of the original 1 mile around the Projects. The Determination also required GLHA to consult with, and conduct the study with, the Penobscot Indian Nation and other stakeholders.

Requested Study Modifications

It its comments, AW/AMC states that the study should not only include an analysis of the effects on those residing within a specified radius around the Projects, but also the effects on the wider community, including Tribal members and vulnerable populations that use project waters for subsistence fishing, recreational enjoyment, and traditional cultural uses and/or artifacts. AW/AMC asserts that the study fails to present a complete picture of potential project effects because it ignores ongoing project operations.

Reply Comments

GLHA, in its reply comments, states that it conducted the study in accordance with the goals and objectives of the approved study plan, and that it continues to perform outreach to the Penobscot Indian Nation regarding this study and the relicensing of the Projects.

Discussion and Recommendation

The approved study plan indicated that a description of socioeconomic conditions would be required in the final license application, and that this information, along with the results of the *Environmental Justice Study*, would be sufficient to address existing information gaps regarding the effects of continuing to operate the Projects on socioeconomics and environmental justice communities [section 5.9(b)(4)]. Moreover, GLHA's study identified low-income environmental justice communities in six of the nine census block groups within a large, 5-mile study area. GLHA attempted, and continues to attempt, to engage with the Penobscot Indian Nation and other stakeholders. Additionally, GLHA conducted additional outreach with interested stakeholders to include the towns of Millinocket, East Millinocket, and Medway. This information, along with the required information on socioeconomic resources, will be sufficient to inform licensing decisions for the Projects [section 5.9(b)(5)]. Finally, GLHA conducted

[18] During the ISR Meeting (May 2-4, 2023), GLHA indicated that it was approaching the study in two phases, and that Phase 2 would include additional outreach with the Penobscot Indian Nation.

the study in accordance with the approved study plan, including enlarging the scope, making attempts to contact the Penobscot Indian Nation, and conducting outreach meetings [section 15(d)(1)]. Therefore, we do not recommend that the geographic scope of the *Environmental Justice Study* be expanded, as requested.

# APPENDIX C

## STAFF RECOMMENDATION ON REQUESTED NEW STUDY

### West Branch Flow Study – Atlantic Salmon Spawning/Rearing Habitat Downstream from McKay Station

Background

Under the current license for the Ripogenus Project (Article 402), Great Lakes Hydro America, LLC (GLHA) operates McKay Station to provide minimum flows to the West Branch for aquatic resources, as well as whitewater boating.[19] These minimum flows normally are released through McKay Station. However, during unit or station outages, the flows are released through a gate at Ripogenus Dam. The minimum flows for aquatic resources are:

- 1,000 cubic feet per second (cfs) (September 16 through October 14);
- At least 1,422 cfs, or inflow, but not less than 1,300 cfs (October 15 through November 15) for salmon spawning; and
- Greater than 1,422 cfs, or the established spawning flow for the year (November 16 through June 7) for salmon incubation.

In is comments, Edward Spear asserts that recent operational modeling iterations highlight the need to confirm the suitability of the current aquatic flows required by the existing license to protect landlocked salmon spawning and incubation habitat in the West Branch of the Penobscot River (West Branch) downstream from McKay Station. Mr. Spear states that there is no empirical data or other information on the suitability of the existing salmon spawning and incubation flows when McKay Station's releases fall below 2,000 cfs, and that additional scientific study is needed to fill this information gap. Mr. Spear specifically requests that the suitability of historical salmon spawning and incubation habitat,[20] as well as habitat in the Holbrook Side Channel (required by existing license Article 406), be evaluated at flows of 1,800, 1,450, and 1,000 cfs. Mr. Spear claims that the existing 1,000-cfs flow was set to optimize turbine efficiency, the spawning and incubation flow of 1,422 cfs is based on the New England Aquatic Base

[19] *See* Table 4.1-1 in GLHA's draft licensed application filed May 3, 2024.

[20] Historical landlocked salmon spawning locations include Holbrook Pool (north side of river), Line Pool, and Abol Bridge Pool, which are all areas downstream from McKay Station.

Flow (ABF) Policy developed by the U.S. Fish and Wildlife Service,[21] and no thought was given to flows of 2,000 cfs or higher (e.g., 2,400 cfs) for economic reasons (i.e., the Ripogenus Project provided power to nearby paper mills).

Requested Study

Mr. Spear states that any aquatic flow required by the license needs to be biologically supported. Therefore, Mr. Spear requests that GLHA conduct a flow study in the West Branch downstream from McKay Station. The goal of the study is to verify that any aquatic flows required by the new license are biologically suitable and support landlocked salmon reproductive needs. Mr. Spear's recommended study would include: (1) visually identifying areas of favorable spawning substrates that are contiguous with historical spawning locations; (2) using GPS (Global Positioning System), or other appropriate methods, to overlay the areas with favorable spawning substrate with those of favorable depth and velocity; (3) using standard, accepted methodologies, to measure water velocity, water depth, degree of embeddedness, and the percentage of fines in potential spawning locations; and (4) a verification process.[22]

Reply Comments

In its reply comments, GLHA states that the existing minimum flow regime for the West Branch downstream from McKay Station was established based on FWS's standard-setting method for determining aquatic base flows (i.e., New England ABF Policy). GLHA also states that the ABF flows were implemented to provide stable river flows during the entire critical spawning and incubation periods for landlocked Atlantic salmon (October 15 thru June 7) to promote spawning, protect salmon eggs from desiccation, and confine spawning to deeper channel areas that are protected from freezing in the winter months. GLHA notes that the spawning and incubation flows included in the existing license were based on 10 years of field observations by

[21] The ABF Policy is defined as 1 cfs per square mile of drainage area for the salmon spawning season and 0.5 cfs per square mile for the remainder of the year. *See* https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2020-01/wd-11-3.pdf, Attachment 1, Appendix A.

[22] Should salmon spawning and incubation flows be in the 1,000- to 1,800-cfs range during the spawning period (November 1-15), the verification process would entail GLHA returning to the sampling locations (e.g., Line and Abol Bridge Pools) after Nov 15. The suitability of spawning substrates and river velocities at various redds would be verified through direct observation. Protection of incubating eggs would require enumerating the redds in the spawning area and collecting data on water velocities (surface and bottom), as well as depths of selected redds. For the Abol Bridge Pool, the verification process would account for tributary inflow.

professional fish biologists.[23] Finally, GLHA states that its 2022 study of the river reach downstream from McKay Station, which is characterized as a set of deep, swift pools and rapids, shows that 1,000 cfs: (1) provides sufficient water for zone of passage (i.e., volitional upstream and downstream movements); (2) supports resident fish species (e.g., landlocked salmon and brook trout), as well as other aquatic organisms; and (3) wets the river channel from bank to bank. GLHA did not respond to Mr. Spear's request for a flow study.

Discussion and Recommendation

The drainage area at the Ripogenus Project is 1,422 square miles. Consistent with the New England ABF Policy, the existing fall and winter flow of 1,422 cfs is equal to an ABF flow of 1.0 cfs per square mile. The minimum flow of 1,000 cfs is equal to 0.7 cfs per square mile of drainage, which is higher than the 0.5 cfs per square mile of drainage (or 711 cfs) recommended by the New England ABF Policy.

Notwithstanding the origin of the existing flows, standard setting methods, such as the New England ABF Policy, are scientifically acceptable approaches to establishing aquatic flows in rivers like the West Branch [section 5.9(b)(6)]. Such methods provide a conservative approach to developing flows that are protective of aquatic resources without the need to do (or in the absence of) costly site-specific flow studies or evaluations (Lang, 1999)[24] [section 5.9(b)(7)]. In addition, using a conservative, standard-setting approach to establish aquatic base flows is sufficient to inform a licensing decision for the Ripogenus Project [section 5.9(b)(5)]. Finally, there has been no material change in any law or regulation applicable to the information request [section 5.15(e)(1)], nor does the study request sufficiently explain why the study was not requested earlier [section 5.15(e)(3)]. Finally, the extraordinary circumstances criterion of section 5.15(f) has not been met. Therefore, we do not recommend that GLHA conduct a flow study downstream from McKay Station, as requested.

[23] Great Northern Nekoosa Corporation. 1991. Ripogenus Project (FERC No. 2572) Application for New License for Major Existing Dam. Great Northern Nekoosa Corporation, FERC No. 2572. Submitted to FERC December 17, 1991. FERC Accession No. 19911217-0214. *See* Volume 14.

[24] Lang, V. 1999. Questions and Answers on the New England Flow Policy. U.S. Fish and Wildlife Service, Concord, New Hampshire. 9 pp. *See* https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2020-01/wd-11-3.pdf, Attachment 1.

# Report of Observations – July 17 and July 24, 2024
## Ramping Study of West Branch of the Penobscot River below McKay Station

Stephen G. Heinz, Maine TU Council FERC Coordinator, September 9, 2024

## Introduction

A study was conducted by Brookfield Renewable (Brookfield) with test events occurring on July 17 and July 24, 2024 to comply with the Federal Energy Regulatory Commission (FERC) Study Plan Determination.[1] Although Brookfield calls this a "Ramping Study" and we have continued to use that title to avoid confusing it with the 2022 Stranding Study, it was not a true ramping study using the methodology of Smokorowski et al. as it did not incorporate gradual step downs of flow and it did not collect data on resultant macroinvertebrate drift. It is difficult to see it as an appropriate follow-up to the Stranding Study because it was conducted at a different time of year (July versus October) and was preceded by different flow patterns.

Brookfield had originally announced the study by email[2] to a small distribution of stakeholders in April proposing to conduct the study June 12 and June 19. TU's response[3] requested the study be conducted in late September or early October because the proposed dates were during the weeks of highest aquatic biological activity, when mortality would be greatest due to temperature, and when TU volunteers would likely be unavailable. MDIFW asked that the studies be in: "late July or early August. Anytime we are conducting landlocked salmon recruitment/population studies, we typically wait until late July or August, so the yoy are large enough to observe/handle."[4] TU asked that low flow observations be conducted during the study.[5] The study plan provided did not cover all the areas where TU volunteers had observed strandings observing the Stranding Study conducted in October of 2022. TU declined to provide participants for the study but noted that it would conduct independent observations.

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[1] FERC Issuance dated September 19, 2024, Subject: Determination on Requests for Study Modifications and New Studies for the Ripogenus and Penobscot Mills Hydroelectric Projects.

[2] Email from Jesse Wechsler. Kleinschmidt Associates of April 26. 2024, Subject: Ripogenus Project Ramping Study Planning.

[3] Steve Heinz email dated April 30, 2024, Subject: Ripogenus Project Ramping Study Planning.

[4] Tim Obrey email dated May 2, 2024, Subject: Ripogenus Project Ramping Study Planning.

[5] Id., "TU intends to propose a safe flow study be conducted as an adjunct to the Ramping Study and proposes to discuss this at the upcoming USR Meeting in Bangor. TU is still unaware of data supporting the flows that comprise the terms and conditions of the current license. The 400 cfs trip event flows allowed under the current license have been demonstrated to cause extensive mortality to fish and macro-invertebrates. If data exists to justify 1000 cfs as a minimum flow in terms of strandings, then please direct us to the study data that shows that. Similarly, if data exists to justify spawning and incubation flow of 1422 to 1300 cfs, then please direct us to that as well. To our knowledge, the 1422 cfs only reflects the general guidance for minimum flow developed by USFWS for New England waters: the catchment area in square miles. More specific data is needed to condition the new license."

Brookfield moved the dates to July when the mortality due to temperature would likely be higher,[6] a date that made comparisons with the Stranding Study less valid. TU comments that the study methodology was inadequate were not acted on,[7] and the study did not include provisions for study of macro-invertebrate drift. "Consultation" consisted of Brookfield informing us of the basics of the releases. We do appreciate that Brookfield employees and contractors were present at the volunteer briefings on both dates to ensure safety and coordination.

TU persisted in requesting lower minimum flows for the study[8] that Brookfield stated would be 1200 cfs.[9] At Big Eddy Campground on July 17, Brookfield Relicensing Manager Mike Scarzello stated that minimum study flows would be 1035 cfs.

This report is organized as follows:


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## Study Event 1 - July 17, 2024

## Methods

Volunteers were instructed to assemble at Big Eddy Campground at 1:00 p.m. on July 17, 2024. A briefing was presented that covered safety, data collection, team composition and area assignment. All volunteers took the briefing, and signed hold harmless/photo authorization forms. Brookfield Relicensing Manager Mike Scarzello and Senior Kleinschmidt Associate Jesse Wechsler along with other formal Brookfield study participants were present.

Safety Instructions:

Work in pairs, keep buddy within sight and sound

[6] Email from Jesse Wechsler. Kleinschmidt Associates of June 26. 2024, Subject: Ripogenus Project Ramping Study Planning.

[7] Steve Heinz email dated May 23, 2024, Subject: Ripogenus Project Ramping Study Planning.

[8] Steve Heinz email dated July 1, 2024, Subject: Ripogenus Project Ramping Study Planning.

[9] Email from Jesse Wechsler. Kleinschmidt Associates of July 13, 2024, Subject: Ripogenus Project Ramping Study Planning.

Wear a PFD, use a wade stick and studded or felt soled boots if/as needed

Primary hazards are slipping and tripping

Take your time and do a thorough search – it's safer and more effective

If someone is injured and you have to go for help, get them out of the watercourse first

Nearest hospital is Millinocket Regional Hospital, 200 Somerset St, Millinocket, ME 04462. This is off Route 11 just past and north of where it is joined by the Golden Road

Event set for 2:00 to 7:00. Pick a watered rock in your vicinity and check for water level periodically - everyone headed to shore at 7:00.

Brookfield may deploy drones. If they do, go to shore until they pass.

Don't get stuck on far bank below the Big Eddy

Water and a snack recommended

Rain gear per forecast

Check out before you leave – everyone must be accounted for

Leave the watercourse if lightning or thunder are noted.

Data Collection Instructions:

Take photos from your vantage point at 15-minute intervals starting at 2:00

Go to areas where you suspect strandings after the water starts to drop

Photo document unconnected pools; document anything alive that you find in unconnected pools - if in doubt, document

Key information: time, location, brief description, photo # , fish species, micro-invertebrate species, other

Use the data sheet provided if you can't keep this all on your phone

Be prepared to show what area you covered at the end of the day and provide a narrative account of your activities

Give the Brookfield/IFW crews a wide berth, do not get in their way, muddy waters, engage them, etc.

As soon as you can, upload your photos to the appropriate folder within https://drive.google.com/drive/folders/1UH_7jwBSjfhio2dBQWY-wlFDoxYNPb3u?usp=sharing

Team Composition:

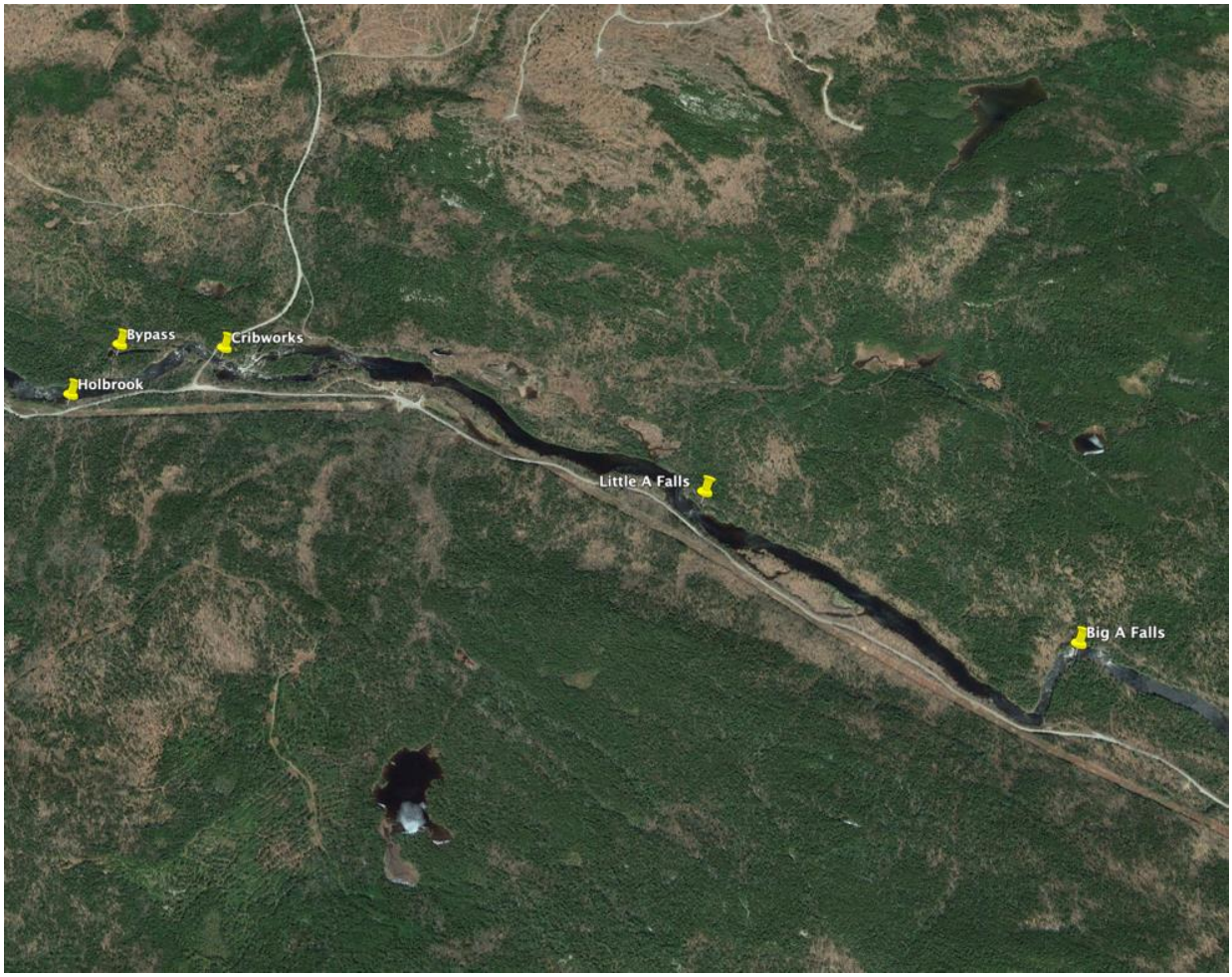
| Team # | members | affiliation | reach |
|---|---|---|---|
| 1 | Mark Gregory | TU | ByPass |
| | Steve Eppich | TU | ByPass |
| 2 | Mike Enos | TU | Holbrook |
| | Jim Hayes | Penobscot Fly Fishers | Holbrook |
| 3 | Neal Hagstrom | TU | Cribworks |
| | Steve Heinz | TU | Cribworks |
| 4 | Russ Vickery | TU | Little A |
| | Ed Spear | Unaffiliated | Little A |
| 5 | Garrett Murth | TU | Big A |
| | John Murphy | TU | Big A |

Team members and kayakers were given the opportunity to review this report. All teams and kayakers confirmed the data contained in this report.

General Area:

Reaches were assigned to be consistent with the five covered during the Stranding Study where stranded fish were found. Figure 1 shows their general locations.

**Figure 1**




General. Each team was given a paper map with the areas of stranding noted during the Stranding Study highlighted in red. These areas were based on where stranded fish were found during the Stranding Study. Suggested vantage points were suggested from which to observe and photograph the receding waters.

Holbrook. The Holbrook side channel and portions on the north bank between the tail of the Little Eddy and where the side channel rejoins the main stem of the river had been assigned during the Stranding Study. Strandings were not expected to occur in the bypass during this study. Map included as attachment A

Holbrook. The south bank of the main channel between the tail of the Little Eddy and Telos Bridge. Map is included as Attachment D.

Cribworks. Area from Telos Bridge to the head of the Big Eddy. Map is included as Attachment G.

Little A Falls. South bank and side channels of the area below Little A Falls. Map is included as Attachment J.

Big A Falls. The east and south banks of Big A Falls and area downstream of the falls to the first riffle. Map is included as Attachment M.

McKay. Area immediately across from McKay Station turbine discharge.

## Results

Flows the day prior to the event were reported as 3200 cfs. The day of the event they were raised to the maximum of 3600 cfs. At 2:00, flows were dropped to the minimum that Brookfield reported in the field as 1035 cfs. The event was scheduled to continue to 7:00 p.m., but Brookfield's and TU's teams were all off the river by about 5:30 and two-generator flow of 2100 cfs was restored at around 6:00 p.m. It should be noted that observations were interrupted by a 20-to-30-minute downpour that occurred about 3:45.

Strandings occurred at a lower rate than was observed during the Stranding Study and fewer salmonids were observed stranded. That levels were only dropped to 1035 cfs rather than the 500 cfs lows of the Stranding Study may account for this. TU hopes that this was not an indication of loss of abundance from the generator trip event that occurred July 7, 2023. This difference may also be due to the fact that the study event occurred nearly three months earlier in the year when parr are smaller. It should also be noted that water levels during the week prior to the study event fluctuated between 3000 during the day and 1800 in the evening, but were 2000 to 2200 cfs prior to the Stranding Study Event making comparisons less valid.

| Team | Fish* | Minnows# | Dead fish & minnows | Invertebrates |
|---|---|---|---|---|
| 1 | 8 | 0 | 8& | Numerous stonefly nymphs and other aquatic insects, 3 crawfish |
| 2 | 5 | 0 | 5@ | 100s of nymphal insects, multiple crayfish |
| 3 | 0 | 2 | 0 | Numerous, mostly stonefly nymphs |
| 4 | 1 | 36 | 1 | Many |
| 5 | 2 | 25 | 16+ | Over 50 stonefly nymphs counted |
| Total | 16 | 63 | 30+ | Quite numerous |

Legend on following page

* Fish were defined as all salmonids and others over 2 inches in length
# Minnows were defined as fish under 2 inches in length
& One dead white perch likely not related to study event
@ Landlocked salmon mortality not related to study event

| | | | | |
|---|---|---|---|---|
| Mercer | 43 | 5 | 0 | Too numerous to count |
| Grand Total | 59 | 68 | 30+ | Many |

Fish. Fewer stranded fish were observed compared to the Stranding Study of 2022.

Invertebrates. Macro-invertebrates were present in abundance. Species included golden stonefly nymphs (Perlidae), black stonefly nymphs (Pteronarcyidae), green rock worm (Rhyacophila), dragon fly nymphs, crayfish, leeches and others.

Minnows. Species included black-nose dace, sculpin, fallfish and others

Photography. Selected team imagery is included with the attachments that are organized by teams. Additional imagery is available for viewing online at https://drive.google.com/drive/folders/1UH_7jwBSjfhio2dBQWY-wlFDoxYNPb3u?usp=drive_link

Additional coverage of the event was provided by Maine Guide Todd Mercer who observed the area directly across from the discharge from McKay Station from a kayak. About 40 salmonids were observed trapped there. Later in the evening, the fish were still alive but trapped. If the low flows had persisted or gone lower than the 1035 cfs provided, we believe that mortality would have occurred.

In an independent effort, kayakers Chris Howe and Miles Puleio kayaked from McKay Station down to the head of the Nesownedahunk Deadwater. They also observed strandings with greatest effect reported upstream.

## Discussion

Area Coverage. The actual area that the 5 volunteer teams covered was relatively small compared to the area specified in the FERC Study Plan Determination[10] or as defined in TU comments on the Draft Stranding Study Plan.[11] The minimum flows of 1000 cfs did not dewater the high stranding area in Team 3's reach, and precluded Team 4 from reaching the north bank of their area, a high stranding and

[10] SPD, page B-4: "...downstream from the McKay Station discharge to Nesowadnehunk Falls."

[11] Maine TU Council letter dated September 23, 2022, Subject: Comments of Maine Council of Trout Unlimited on the Draft Fish Stranding Study Plan, page 2.

mortality area in the Stranding Study. A ballpark figure for close coverage of the area was 1 to 2 % of the area FERC specified in the SPD.

Predation. Predation was not observed during the Ramping Study events of either day. We believe that stranded minnows and macro-invertebrates would have experienced predation-related mortality if flows higher than the 1000 cfs study flows had not been immediately restored.

Mortality Factors. Air temperatures approaching 90 degrees F were observed on the July 17 event. A downpour that passed through the study area likely prevented significant mortality to stranded Macro-invertebrates. Lesser mortality would have been incurred by relatively mobile macro-invertebrates such as crayfish and stonefly nymphs, high mortality would have been the outcome for leeches, caddisfly larvae and mayfly nymphs. Without the rain, caddis larvae would likely have been greatly affected.

Larger Ecological Effects. Few dead fish or macro-invertebrates were observed, and fewer stranding strandings occurred. While the Stranding Study identified some areas of high stranding and mortality, the Ramping Study teams did not, but did observe some stranding on the margins of their reaches.

## Conclusion

The observations conducted by TU teams deployed during the July 17 Study Event demonstrate that stranding and mortality occur downstream from McKay Station when flows are reduced abruptly from 3600 cfs to 1035 cfs. Fewer salmonid strandings were observed and that could be because there are fewer salmonid YOY present following the July 7, 2023 generator trip event where mortality was observed, and was presumably wide spread. The study event was conducted nearly three months earlier in the year than the Stranding Study, and the smaller-sized salmonid parr may have been in different locations or affected differently. TU has persistently asked that the Ramping Study be conducted in Late September or early October. Conducting the study at a different time of the year compromises comparisons with the Stranding Study. Time of day appeared to be a factor as well with reflection and glare being more problematic during the afternoon as opposed to the morning timeframe of the Stranding Study with a lower sun angle.

The strandings at McKay Station that Todd Mercer provided had not been imaged before, and this provided additional surety that the reports of mortality from July 8, 2023 following the trip event were accurate. This and observations by the kayakers indicated that some amount of stranding and mortality occurs throughout the reach that is highly dependent on micro-topography, and the only way to accurately assess strandings would be to survey the entire reach.

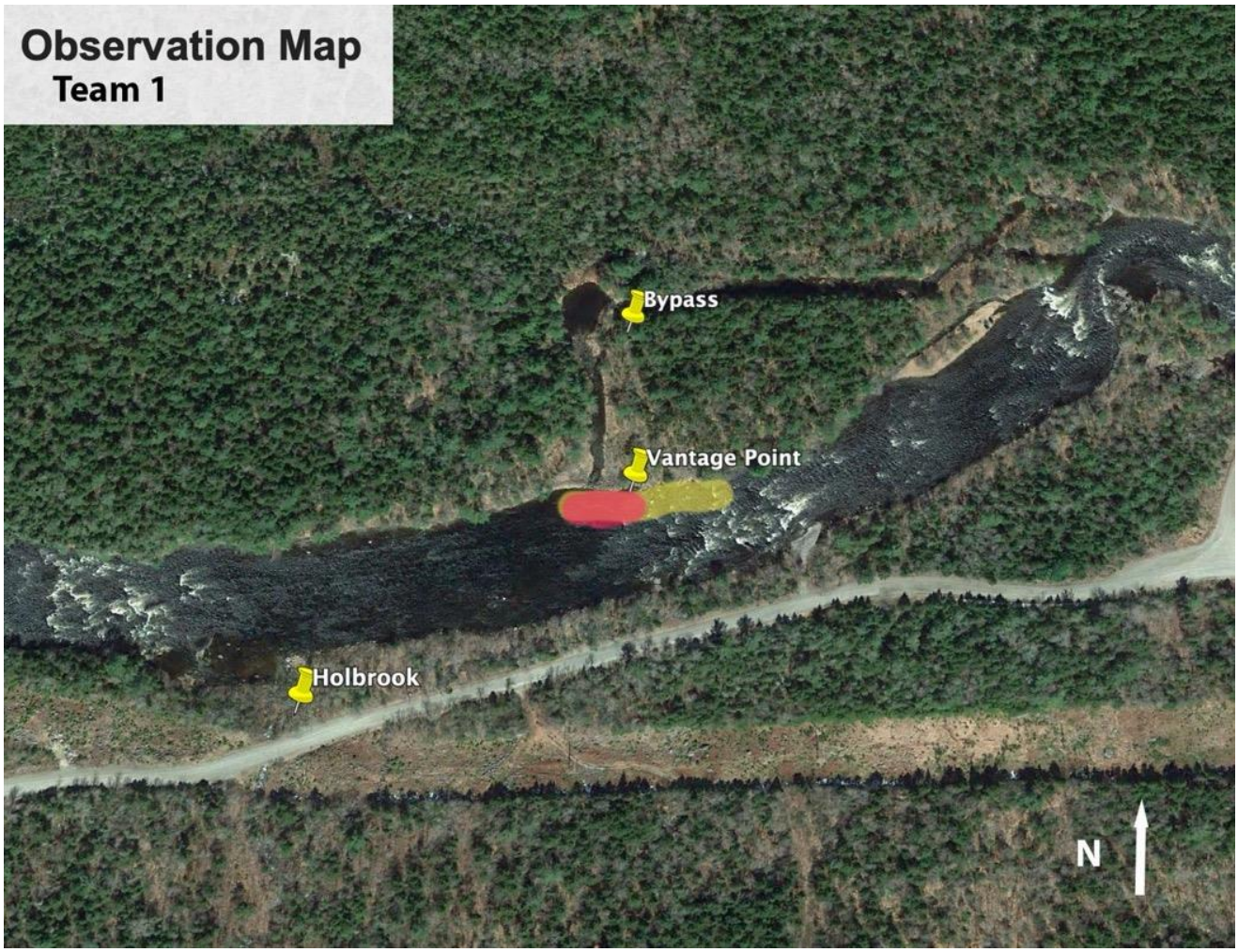
Video obtained by Chris Howe showed the incredible abundance of macro-invertebrates in the gorge that had not been imaged in the Stranding Study. Caddis were abundant and their larvae are immobile or with limited mobility making them highly susceptible to mortality under either flow decrease scenario. The waterline established by nominal 2000 cfs summer flows was visible, and mortality to

these larvae would start to occur when flows go below that line and increase exponentially with lower flows.

## Attachments:

A. Team 1 Map
B. Team 1 Debrief Sheet
C. Team 1 Photos
D. Team 2 Map
E. Team 2 Debrief Sheet
F. Team 2 Photos
G. Team 3 Map
H. Team 3 Debrief Sheet
I. Team 3 Photos
J. Team 4 Map
K. Team 4 Debrief Sheet
L. Team 4 Photos
M. Team 5 Map
N. Team 5 Debrief Sheet
O. Team 5 Photos
P. Todd Mercer Observations
Q. Kayaker Observations

## Attachment A




yellow: coverage area, red; Previous high stranding

## Attachment B

Debrief Sheet – Team 1

Team Members: Mark Gregory and Steve Eppich

Reach: Area outside of the Holbrook Side Channel berm and area immediately downstream

Percent Coverage: 100%

Vantage point photos: 2:20 to 4:35

Number of stranded fish: 8, all dead

Number of stranded invertebrates: numerous stonefly nymphs and other aquatic insects, 3 crawfish

Number of stranded others: none

Narrative: The team arrived at their assigned reach at 2:15 p.m. Water levels had already dropped approximately 24”. Observed 4 salmon parr about 2 inches in length, black dace minnows and one white perch.

Investigated the area downstream but did not observe strandings there. No observable changes after 3:00 p.m. The team departed the area at 3:45 and returned to the campground.

# Attachment C

## Vantage Point Sequence

Times unavailable



## Strandings

Selected photos, additional available at https://drive.google.com/drive/folders/1SHyG3-mOjK9gEFVz8_WXMA9IbQ1Q5nWc?usp=drive_link



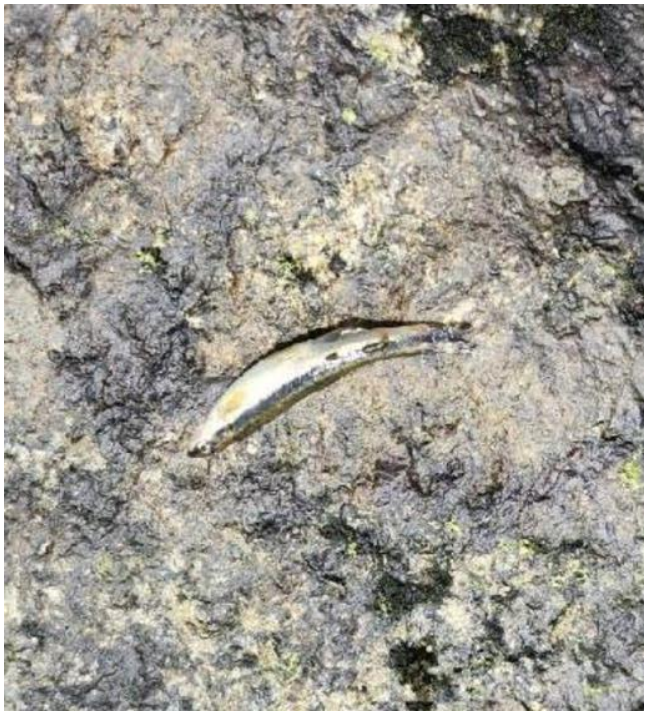
Stranded stonefly nymphs



Dead brook trout parr

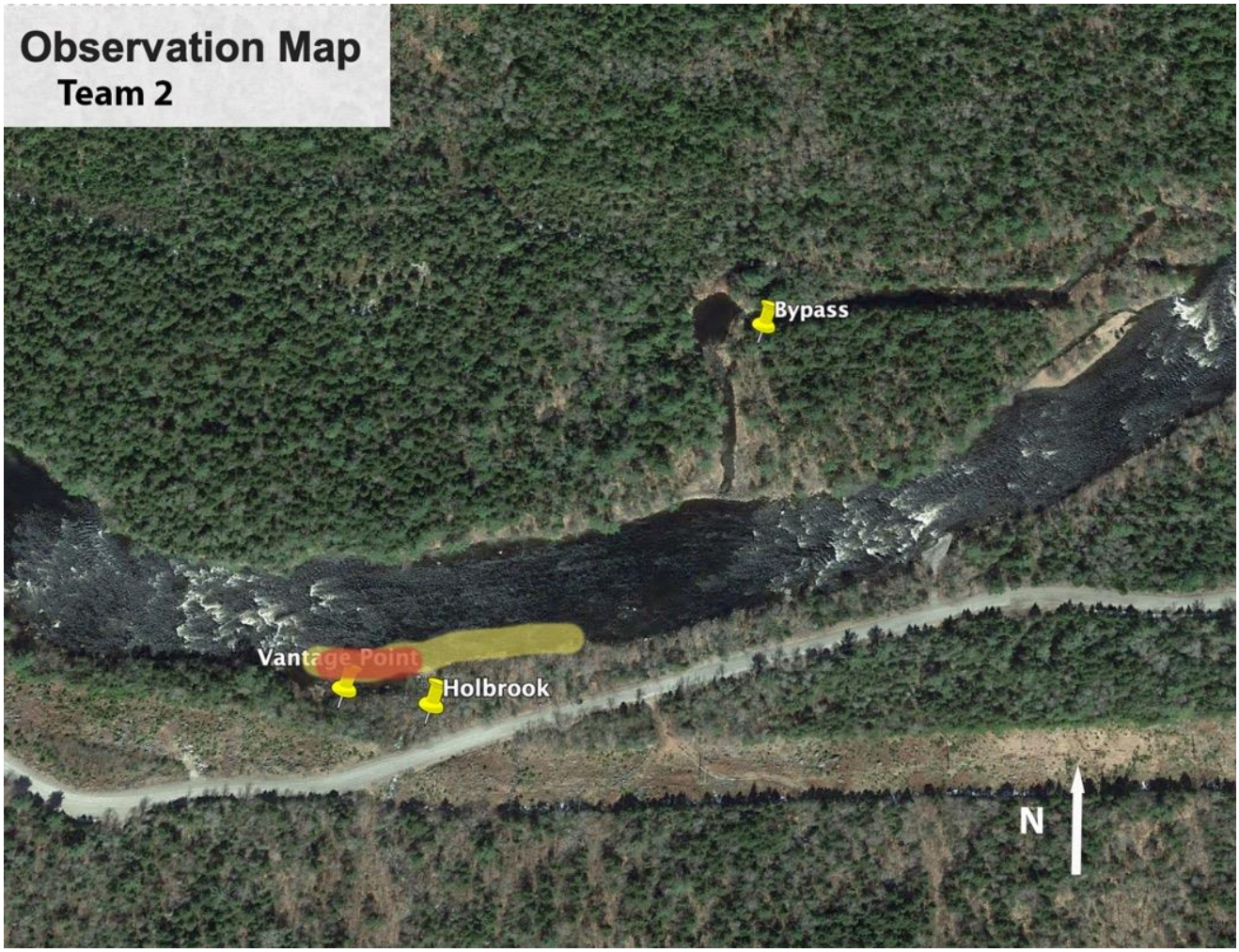


Dead brook trout parr



Dead large blacknose dace

## Attachment D




yellow: coverage area, red; previous high stranding area

## Attachment E

Debrief Sheet – Team 2

Team Members: Mike Enos and Jim Hayes

Reach: Holbrook

Percent Coverage: 100%

Vantage point photos: yes

Number of stranded fish: 4 small dead brook trout and one previously injured 12-inch landlocked salmon

Number of stranded invertebrates: thousands of insect larvae, 24 crayfish

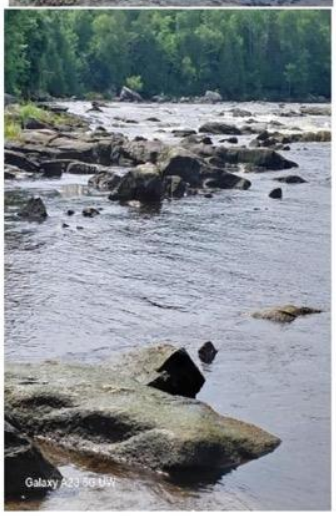
Number of stranded others: 12 minnows

Narrative: Team arrived at vantage point at 2:00 p.m. and took photos showing initial water levels. By 2:10, the water had fallen 10 inches, by 2:15, it was down 16 inches, by 2:30 down 26 inches and by 2:45 it was down maybe 30 inches and stable.

At 2:45, we started a shoreline survey and found stranded aquatic insects, fish and crayfish. At 3:50, we'd completed covering the survey area and retired during the rain storm until 4:45.

## Attachment F

## Vantage Point Sequence

| Time | |
|---|---|
| 2:00 |  |
| 2:30 |  |
| 3:00 |  |

## Strandings

Selected photos, additional available at https://drive.google.com/drive/folders/1DfZXOIIrDxZTHJk1-4Wsnk5jh3MMprXs?usp=drive_link



2 dead landlocked salmon parr



3 species of stranded caddisfly larvae



Stranded and dead crayfish



Stranded dragonfly nymph

## Attachment G




yellow: coverage area, red: prior high stranding area

## Attachment H

Debrief Sheet – Team 3

Team Members: Neal Hagstrom and Steve Heinz

Reach: Cribworks

Percent Coverage: 75%

Vantage point photos: multiple

Number of stranded fish: 1 possible stranded salmon parr observed, no photos

Number of stranded invertebrates: Macro-invertebrates included black and golden stonefly nymphs, green rockworms, and leeches

Number of stranded others: 9 minnows, all alive

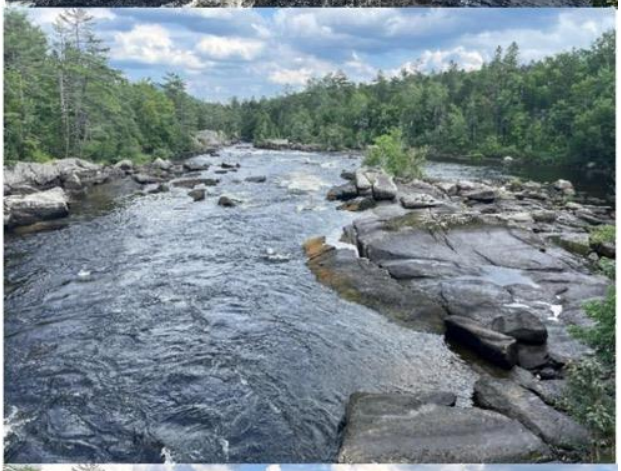
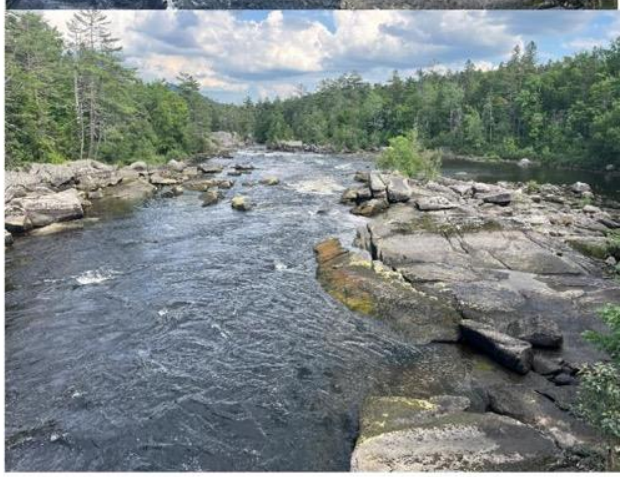
Narrative:

Team arrived at Telos Bridge at 2:00 and established a vantage point just south of the bridge. Took photos river left, straight down and river right toward high stranding area noted in Stranding Study. Quickly observed water levels starting to drop. Stranded pools formed by 2:17 on the right below Telos Bridge. Observed possible salmon parr, minnows and many stranded stonefly nymphs with no mortality observed. No usable images obtained of stranded minnows. Continued vantage point shots until 3:00 p.m. High stranding area noted in the Stranding Study did not dewater at minimum flows. Investigated area on river left from bridge to Cribworks. Photographed a stranded leech and a stranded sculpin and other minnows. Returned to vantage point for additional photos at 3:45 and 4:20. Departed the reach shortly after.

# Attachment I

## Vantage Point Sequence

Stranding area on river right remained watered.

| Time | |
|---|---|
| 2:00 |  |
| 2:30 |  |
| 3:30 |  |

## Strandings

Selected photos, additional available at https://drive.google.com/drive/folders/1cIB6n0b1xo3ij6MqANVJyRz7D5pnrt3B?usp=drive_link



Stranded stone fly nymph and caddisfly larvae



Isolated pool possibly containing a salmonid

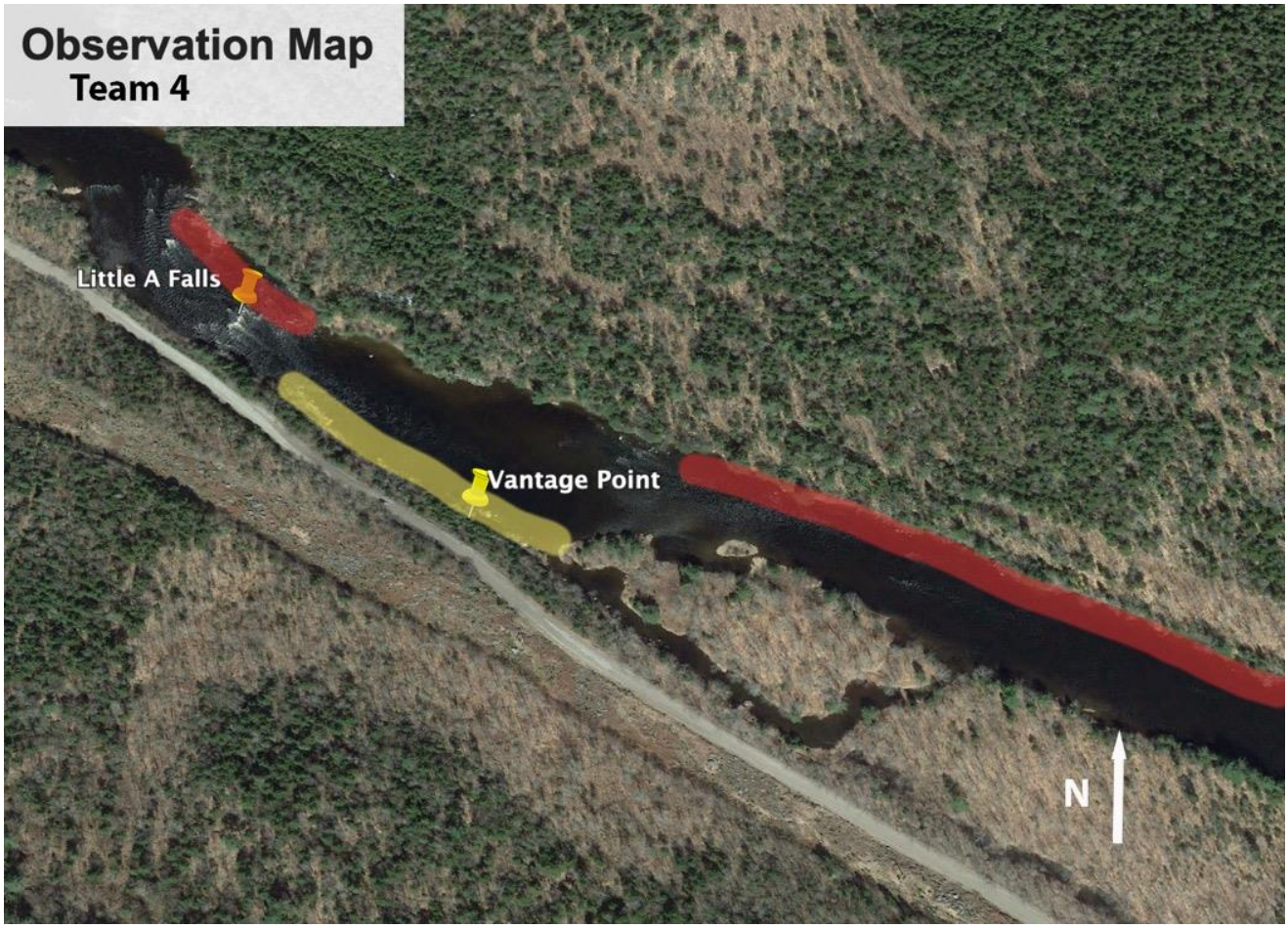


Stranded leech



Stranded caddisfly larva

## Attachment J




yellow: coverage area, red; previous high stranding

## Attachment K

Debrief Sheet – Team 4

Team Members: Ed Spear and Russ Vickery

Reach: Little A Falls

Percent Coverage: 20%, others observed in areas downstream, flow precluded access to north bank

Vantage point photos: yes

Number of stranded fish: I dead salmon parr

Number of stranded invertebrates: many including 100s of stonefly nymphs and some crayfish

Number of stranded others: ~36 shiner minnows

Narrative: The team arrived at the reach before 2:00 and began taking vantage point photos. 1000 cfs flows precluded coverage of high stranding areas from Stranding Study on the north bank. Water stabilized and the crew investigated possible strandings areas at 3:15. Our reach was an area with gradient, depth and substrates favorable to juvenile salmon and macro-invertebrates of different species. Team observed stranded aquatic insects and dead, stranded and escaping fish.

Our location at the top of Little A Falls was an area with gradient, depth and substrates favorable to Juvenile salmon and obviously, Aquatic Macroinvertebrates of different species. After perhaps an hour of falling water, this area became hydraulically isolated from the main channel and any “significant” flow. Fish, including salmon young-of-the year (YOY) began moving, some toward the small braided outlet channel. I observed at least one YOY escape downstream and out of the area being drained of flow, slowly losing depth and velocity. Stone flies were crawling everywhere, mayflies that tend to be sub-surface were not obvious. Macro-invertebrates that appeared to be cased caddis were often observed, but this could possibly have been some species of diptera.

A heavy shower arrived about 4:00 that ended our observation period, watered the reach, increasing flow, and wetting areas that might have otherwise dried up. We departed the area shortly thereafter.

# Attachment L

## Vantage Point Sequence

| Time | |
|---|---|
| 1:55 |  |
| 2:30 |  |
| 3:00 |  |

## Strandings

Selected photos, additional available at https://drive.google.com/drive/folders/1UI0QLro27iZ7rkrp7mM6i4LhVq1ol-lY?usp=drive_link



Stranded and dead stonefly nymphs and caddis larvae



Dead salmon parr

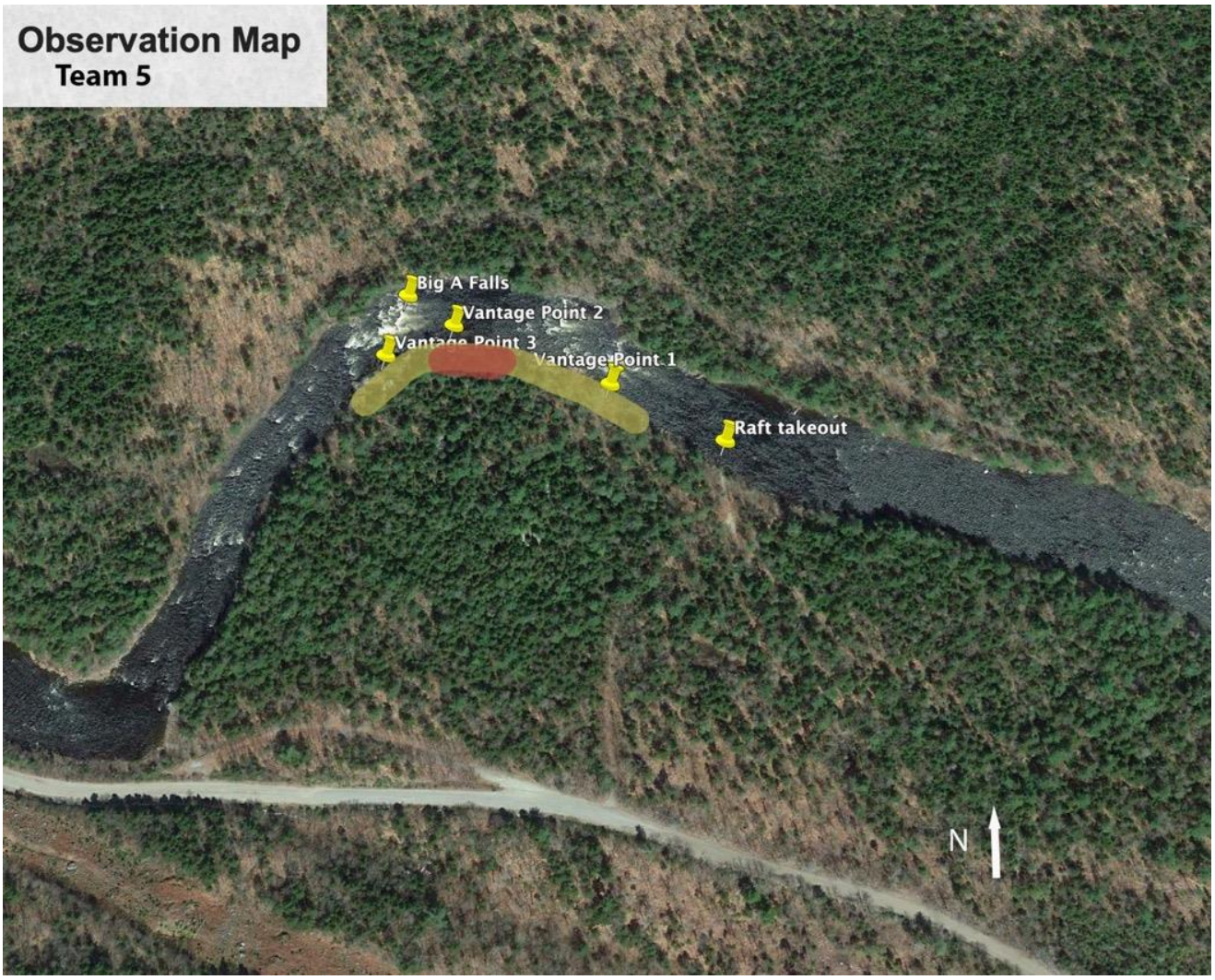


Stranded crayfish



Stranded stonefly nymph

## Attachment M




yellow: coverage area, red; previous high stranding

## Attachment N

Debrief Sheet – Team 5

Team Members: Garrett Murch and John Murphy

Reach: Big A Falls

Percent Coverage: 80%

Vantage point photos: 2:20 to 4:35

Number of stranded fish: two - one stranded brook trout (alive), one dead 10 ” landlocked salmon

Number of stranded invertebrates: many including over 50 stonefly nymphs, 2 crayfish and 4 caddis nymphs.

Number of stranded others: About 24 dace minnows, all dead.

Narrative: The team arrived at the reach at 2:06 and established 3 vantage points: 1 at 2:06, 2 at 2:12, and 3 at 2:23. Team observed a drop in water levels at all sites at 2:50. At 3:07, about a 1-foot drop was observed at Point 2, and isolated pools began to form. Stranded stonefly nymphs were noted at Point 3 at 3:15 and at Point 1 at 3:24. At 3:30, 5 stranded minnows were noted at Points 2 and 3. Heavy rain started at 3:50. Work resumed at 4:25. Point 2 contained the most strandings: a dead 10 inch landlocked salmon, a stranded brook trout parr, and over 15 dead dace. A stranded crayfish was noted at 4:35. The team departed the area shortly after. The number of stranded caddis and golden stones was quite sizeable in certain locations.

## Attachment O

### Vantage Point Sequence

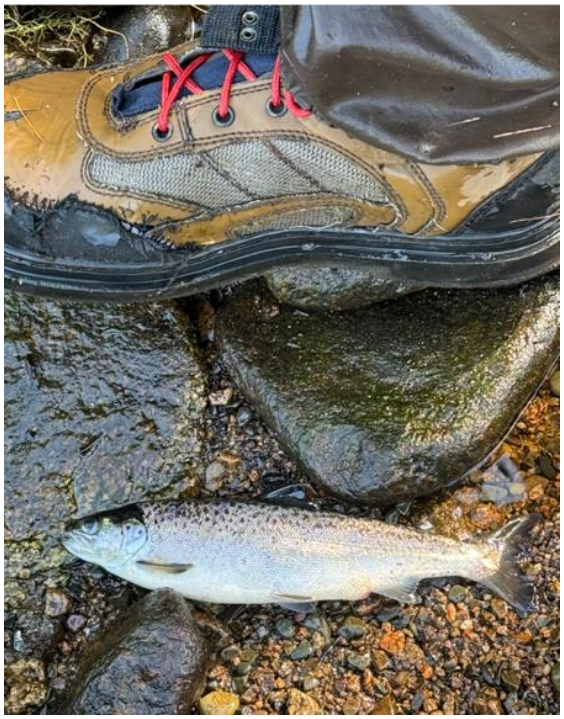
| Time | |
|---|---|
| 2:00 |  |
| 2.36 |  |
| 2:50 |  |

## Strandings

Selected photos, additional available at https://drive.google.com/drive/folders/1mfl9b3HR3wCZPHt3emzf1hnlL1BSGXdd?usp=drive_link



Stranded brook trout



Dead landlocked salmon



Multiple dead black nosed dace



Stranded Isonychia nymph

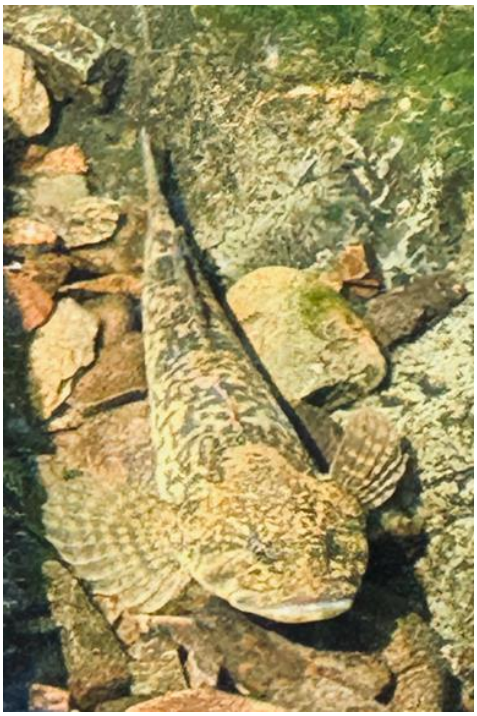
Selected photos, additional and video available at https://drive.google.com/drive/folders/1-Q_PO8FL0J9O_n_U-ktJ-F7cLqjjDq3o?usp=drive_link

## Attachment P

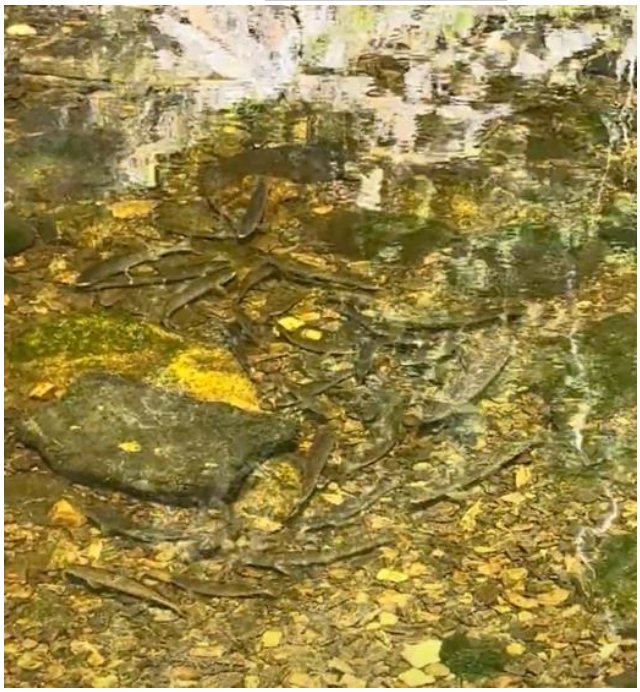
Maine Guide Todd Mercer made observations in the area of the McKay Station turbine discharge by kayak. The results were striking with over 40 salmonids, sculpin and an American eel trapped behind a boulder wall across from the most upstream of the turbines. Had the low flows persisted, these would likely have mostly become mortalities. Photos follow, video is available online.



Stranding pool



Stranded sculpin



Stranded adult landlocked salmon



Stranded adult brook trout

## Attachment Q

Selected photos, additional and brief video available at https://drive.google.com/drive/folders/1gGlTz0ZGEZ9a3iOo2y3l5kEFKop6NwWQ?usp=drive_link

Miles Puleio and Chris Howe traveled downstream from McKay Station to the head of Nesowadnehunk Deadwaters by kayak. Miles Puleio provided photos that showed strandings in areas that map study would not have indicated were worthy of investigation. Based on this and the observations of Team 4 who could not access the high stranding areas identified in the Stranding Study, specific topography drives stranding and mortality throughout the entire reach that they covered, but decreasing downstream as the rate of change attenuated. It would be difficult to accurately quantify without assigning observers to cover the entire reach. Selected photos follow:



Stranded brook trout parr



Stranded crayfish



Stranded minnows, stonefly nymph and crayfish



Stranded brook trout parr

Chris Howe made a video of his efforts that is at https://drive.google.com/file/d/1NqAET8naBmkGZhpyJDolzV00NIUrXfZ0/view?usp=sharing While the movie captures stranded salmonids and even a brown bullhead catfish photo below, what is truly remarkable is the abundance of nymphs and aquatic insect larva. The video gives you a better appreciation of the impacts on aquatic life than this representative frame from the video.



Stranded brown bullhead catfish



Abundant caddis larvae

## Study Event 1 - July 24, 2024

## Methods

Volunteers were instructed to assemble at Big Eddy Campground at 1:00 p.m. on July 24, 2024. A briefing was presented that covered safety, data collection, team composition and area assignment. All volunteers took the briefing, and signed hold harmless/photo authorization forms. Senior Kleinschmidt Associates Jesse Wechsler along with a few other formal Brookfield study participants were present. Safety and data collection instructions were as had been given on July 17.

Team Composition:

| Team # | members | affiliation | reach |
|---|---|---|---|
| 1 | Max Tritt | NOAA | ByPass |
| | David Bean | NOAA | ByPass |
| 2 | Matt Tilley | TU | Holbrook |
| | Joe Croteau | TU | Holbrook |
| 3 | Steve Heinz | TU | Cribworks |
| | Neal Hagstrom | TU | Cribworks |
| 4 | Mac Mclain | TU | Little A |
| | Sean Beauregard | PIN | Little A |
| 5 | Rory Hannon | UMO | Big A |
| | John Singletary | UMO | Big A |

Team members and kayakers were given the opportunity to review this report. All teams and kayakers confirmed the data contained in this report.

General Area:

Reaches were assigned as per July 17.

## Results

Whitewater flows were maintained up to the day of the event when they were raised to 3600 cfs at 8:00 a.m. At 2:00, flows were reduced ~ 2300 cfs for an hour. At 3:00, flows were reduced to ~1000 The event continued until about 6:30 p.m.

Strandings occurred at a lower rate than was observed during the Stranding Study and fewer salmonids were observed stranded. That levels were only dropped to 1035 cfs rather than the 500 cfs lows of the

Stranding Study may account for this. TU hopes that this was not an indication of loss of abundance from the generator trip event that occurred July 7, 2023. This difference may also be due to the fact that the study event occurred nearly three months earlier in the year when parr are smaller. It should also be noted that water levels during the week prior to the study event fluctuated between 3000 during the day and 1800 in the evening, but were 2000 to 2200 cfs prior to the Stranding Study Event making comparisons less valid.

| Team | Fish* | Minnows# | Dead fish & minnows | Invertebrates |
|---|---|---|---|---|
| 1 | 2 | 25 | 2 | Many stonefly nymphs, 6 crayfish, some leeches |
| 2 | 0 | 0 | 0 | 1 crayfish, 1 caddis larva, no mortality observed |
| 3 | 4 | 40 | 0 | Numerous stonefly nymphs, some green rockworms |
| 4 | 4 | 11 | 0 | >50 Stonefly nymphs, 3 crayfish, 1 leech, 1 isonychia nymph |
| 5 | 2 | 1 | 2 | Over 50 stonefly nymphs counted |
| Total | 12 | 77 | 4 | Numerous |

* Fish were defined as all salmonids and others over 2 inches in length
\# Minnows were defined as fish under 2 inches in length

| | | | | |
|---|---|---|---|---|
| Mercer | 20 | 5 | 0 | Too numerous to count |
| Grand Total | 32 | 82 | 4 | Numerous |

Fish. Fewer stranded fish were observed than during the Stranding Study and slightly less than the July 17 study event. Little mortality was observed, but we believe that mortality would have been the result if the low flow was maintained or the temperature conditions worse than the air temperatures in the mid-70s and water temperatures in the low 70s.

Invertebrates. Macro-invertebrates were present in abundance. Species included golden stonefly nymphs (Perlidae), black stonefly nymphs (Pteronarcyidae), green rock worm (Rhyacophila), dragon fly nymphs, crayfish, leeches and others.

Minnows. Species included black-nose dace, sculpin, fallfish and others.

Photography. Selected team imagery is included with the attachments that are organized by teams. Additional imagery is available for viewing online at https://drive.google.com/drive/folders/1Wt5DG3qIfhYe_ufNtITUM0U7ykVgDPpx?usp=drive_link

Additional coverage of the event was provided by Maine Guide Todd Mercer who observed the area directly across from the discharge from McKay Station from a kayak. Over 20 salmonids were observed trapped there. Later in the evening, the fish were still alive but trapped. Two-generator operation flows of 1800 cfs were restored quickly, but we believe that mortality would have resulted if low flows had persisted or gone lower than the ~1000 cfs study flow. A video of the stranding pool is included with the photography.

In an independent effort, kayakers Chris Howe and Miles Puleio kayaked from McKay Station to Big Eddy Campground. Their results were similar to those obtained on July 17. Photos and video were provided.

## Discussion

Area Coverage. The actual area that the 5 volunteer teams covered was relatively small compared to the area specified in the FERC Study Plan Determination[12] or as defined in TU comments on the draft stranding study plan.[13] The minimum flows of 1000 cfs did not dewater the high stranding area in Team 3's reach, and precluded Team 4 from reaching the north bank of their area, a high stranding and mortality area in the Stranding Study. A ballpark figure for close coverages of the area was 1 to 2 % of the area FERC specified in the SPD.

Predation. Predation was not observed during the Ramping Study events of either day. We believe that stranded minnows and macro-invertebrates would have experienced mortality if the 1000 cfs flows were not immediately restored.

Mortality Factors. Environmental factors were relatively benign compared to the July 17 event with temperatures in the 70s and cloudy skies.

Larger Ecological Effects. Fewer dead fish or macro-invertebrates were observed, and fewer strandings occurred. While the Stranding Study identified some areas of high stranding and mortality, the Ramping Study teams did not, but did observe some stranding on the margins of their reaches.

## Conclusion

The observations conducted by TU teams deployed during the July 24 Study Event demonstrate that stranding and mortality occur downstream from McKay Station when flows are reduced from ~2400 cfs to ~1000 cfs, but the stranding rate is similar to the more drastic reduction from 3600 cfs to 1000 cfs. Lingering effects from the July 17 event could be a factor. It should be noted that Team 2 found no

[12] SPD, page B-4: "...downstream from the McKay Station discharge to Nesowadnehunk Falls."

[13] Maine TU Council letter dated September 23, 2022, Subject: Comments of Maine Council of Trout Unlimited on the Draft Fish Stranding Study Plan, page 2.

strandings during the event of July 24, when the July 17 counterparts did; Team 3 found many more stranding during the July 24 event than it did during the July 17 event: and, the area at McKay where over 40 salmonids were discovered stranded saw about half the strandings that occurred on July 17. Variation in the number of strandings between events could be based on any number of factors. We think that the habitat disruption and mortality caused by the study event on July 17 affected the results on July 24. Without a multi-year study, it is difficult to identify specific causes.

The stranded fish would likely have become mortalities had the low flow conditions persisted. The study event was conducted nearly three months earlier in the year than the Stranding Study, and the smaller-sized salmonid parr may have been in different locations or affected differently.

The abundant caddis larvae would likely have been mortalities as well, had the 1000 cfs flows, legal under the current license, been allowed to persist. The waterline established by nominal 2000 cfs summer flows was visible, and mortality to these larvae would start to occur when flows go below that line and increase exponentially with lower flows.

## Attachments:

AA. Team 1 Map

BB. Team 1 Debrief Sheet

CC. Team 1 Photos

DD. Team 2 Map

EE. Team 2 Debrief Sheet

FF. Team 2 Photos

GG. Team 3 Map

HH. Team 3 Debrief Sheet

II. Team 3 Photos

JJ. Team 4 Map

KK. Team 4 Debrief Sheet

LL. Team 4 Photos

MM. Team 5 Map

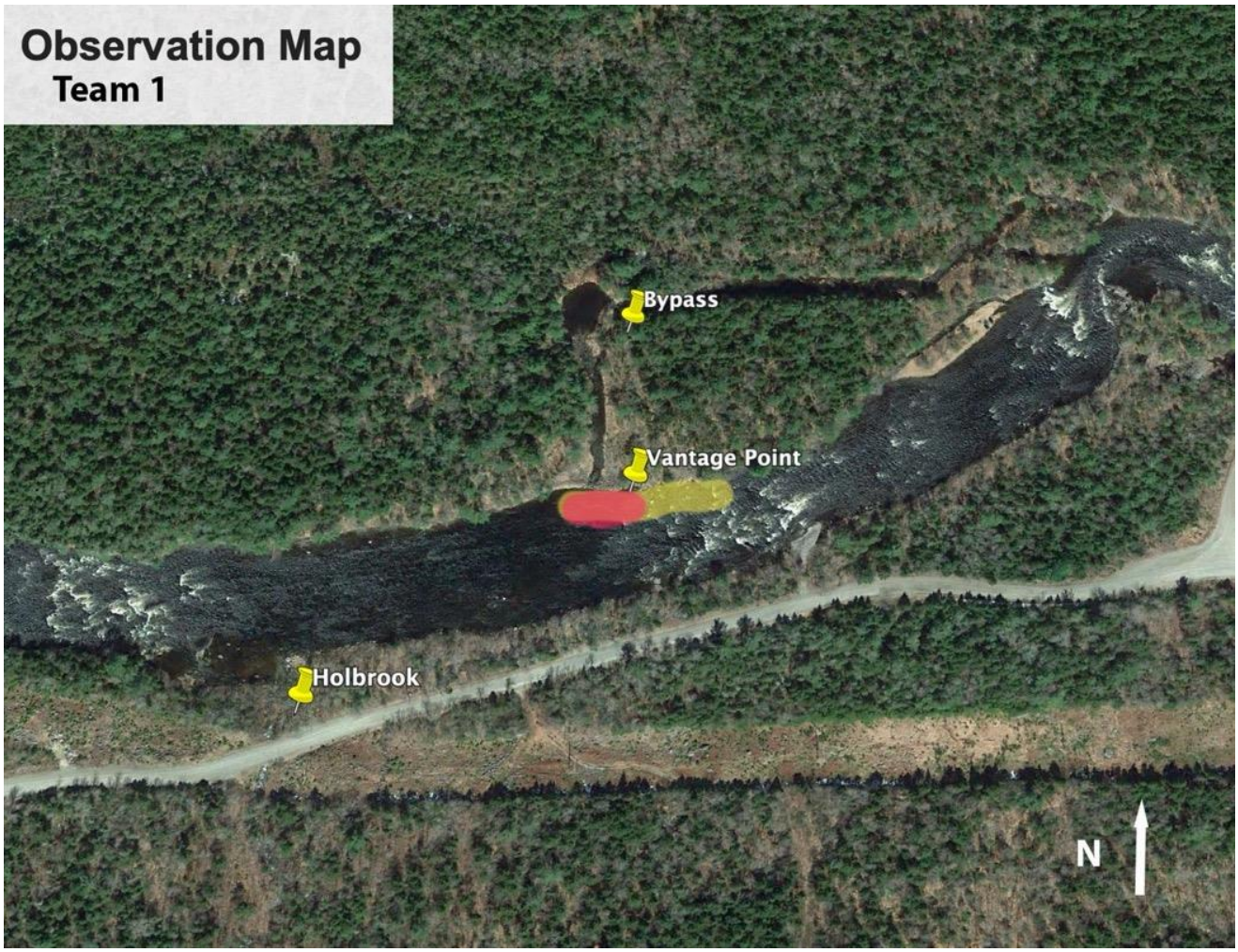
NN. Team 5 Debrief Sheet

OO. Team 5 Photos

PP. Todd Mercer Observations

QQ. Kayaker Observations

## Attachment AA




yellow: coverage area, red; Previous high stranding

## Attachment BB

Debrief Sheet – Team 1

Team Members: Max Tritt and David Bean

Reach: Area outside of the Holbrook Side Channel berm and area immediately downstream

Percent Coverage: 100%

Vantage point photos: 2:00 to 5:00

Number of stranded fish: 2 dead fish

Number of stranded invertebrates: numerous stonefly nymphs, 6 crawfish, leeches

Number of stranded others: 25 minnows including black nose dace

Narrative: The team arrived at their assigned reach at 2:00 and took vantage point photos. By 3:15, stranding pools had formed. At 3:00, stranded crayfish and stoneflies were observed. At 3:40, a dead salmon and some stranded minnows were observed. Team departed the reach at 5:00.

Additional note: The Holbrook bypass remained watered throughout the event.

# Attachment CC

## Vantage Point Sequence

Includes gage heights

| Time | Gage Height | |
|---|---|---|
| 2:20 | 12.0 in. |  |
| 2:30 | 12.7 in. |  |
| 2:47 | 12.8 in. |  |
| 3:16 | 12.8 in. |  |
| 4:14 | 14.2 in. |  |

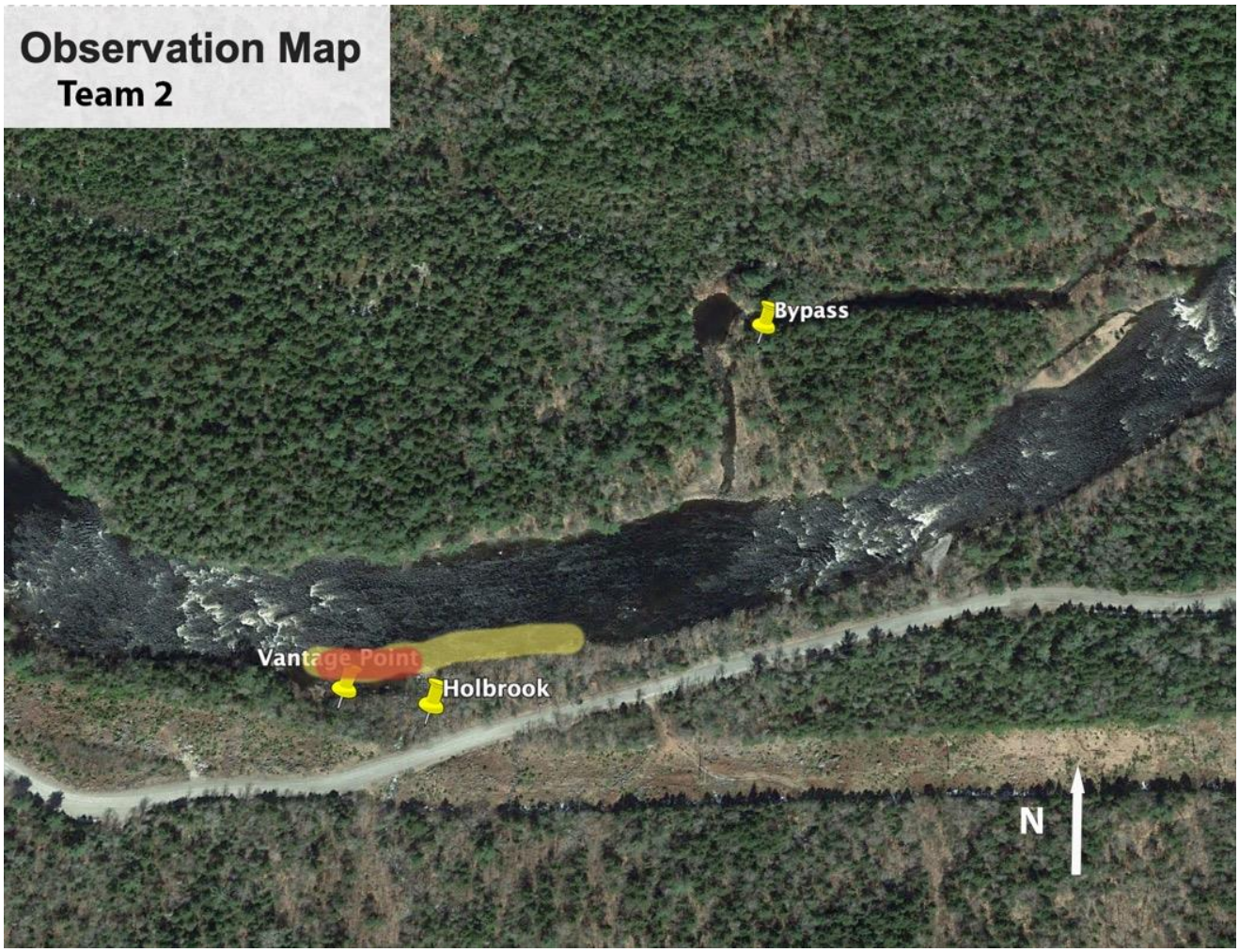
## Stranding

Selected photos, additional available at https://drive.google.com/drive/folders/1UiAwjTZ6XBF7-eGAGT0dHwApY4q0Kb9i?usp=drive_link



Dead brook trout parr

## Attachment DD




yellow: coverage area, red; previous high stranding area

## Attachment EE

Debrief Sheet – Team 2

Team Members: Matt Tilley and Joe Croteau

Reach: Holbrook

Percent Coverage: 100%

Vantage point photos: yes

Number of stranded fish: none

Number of stranded invertebrates: 1 crayfish, 1 caddis larva

Number of stranded others: none

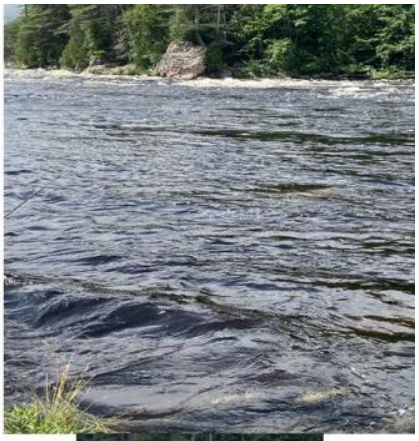
Narrative: Team arrived at vantage point at before 2:00 p.m. and took photos showing initial water levels. By 2:25, water levels had fallen 12 to 14 inches. Continued to take vantage point photos. One stranding pool noted. 15 to 20 brook trout noted at the confluence with Holbrook Brook. Departed the area at 4:05.

## Attachment FF

### Vantage Point Sequence

**Time**

**2:00**



**2:35**



**3:00**



**3:30**



## Stranding Pools

Selected photos, additional available at https://drive.google.com/drive/folders/1swi2PnUDSBl5aQpUTGjMRQn2IJ6pw6fJ?usp=drive_link



Stranding Pools

## Attachment GG




yellow: coverage area, red: prior high stranding area

## Attachment HH

Debrief Sheet – Team 3

Team Members: Neal Hagstrom and Steve Heinz

Reach: Cribworks

Percent Coverage: 75%

Vantage point photos: multiple

Number of stranded fish: 1 brook trout and at least 3 fallfish

Number of stranded invertebrates: Macro-invertebrates included black and golden stonefly nymphs, green rockworms, and leeches

Number of stranded others: 40 minnows, all alive

Narrative:

Team arrived at Telos Bridge at 2:00 and established a vantage point just south of the bridge and began taking vantage point photos that persisted throughout the period. Stranding pools developed below the south end of Telos Bridge by 2:35 that were investigated, but no stranded organisms were observed. Further flow reduction and dewatering noted by 3:13. Multiple stranding pools formed where fallfish, minnows and macro-invertebrates were observed. The high stranding area observed during the stranding study again did not form at the ~1000 cfs flow. Crossed over to north bank and observed more strandings including, a brook trout, leeches and other aquatic insects. Departed the reach at 4:00

# Attachment II

## Vantage Point Sequence

Again, prior stranding area river right remained watered.

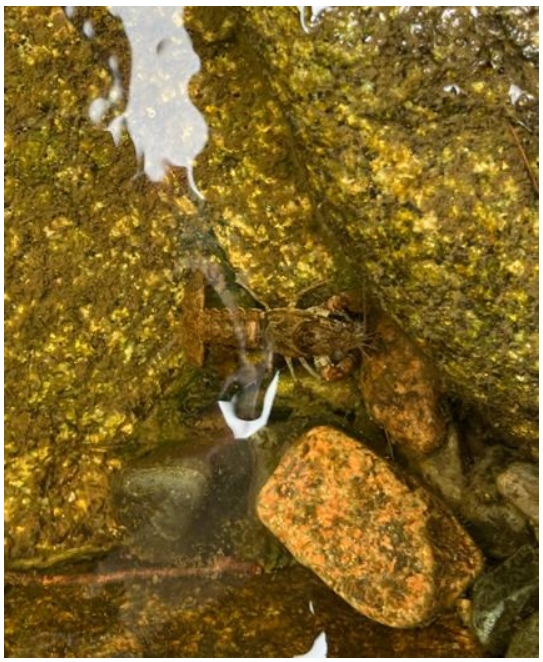
| Time | |
|---|---|
| 2:00 |  |
| 2:30 |  |
| 3:00 |  |
| 3:45 |  |

## Strandings

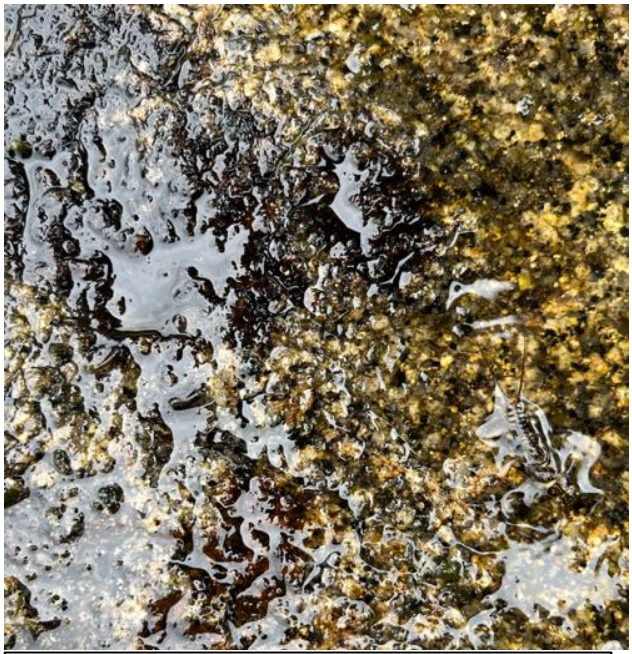
Selected photos, additional available at https://drive.google.com/drive/folders/1hvVXpsd488Aj_SN-vStbmyTUKhEyDv4y?usp=drive_link



Stranded minnows



Stranded crayfish

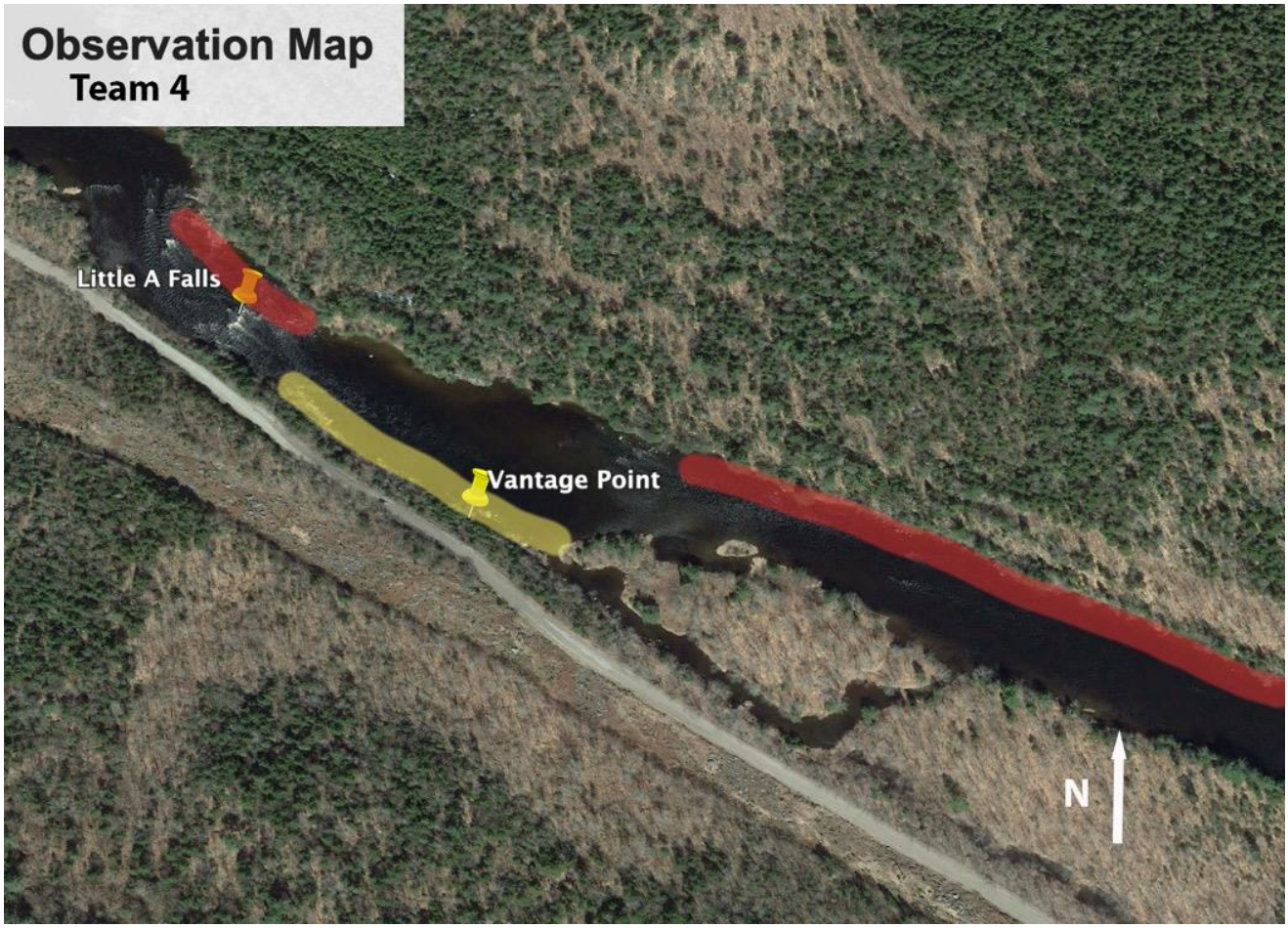


Stranded stonefly nymphs and caddis larva



Stranded brook trout

## Attachment JJ




yellow: coverage area, red; previous high stranding

## Attachment KK

Debrief Sheet – Team 4

Team Members: Mac McClain and Sean Beauregard

Reach: Little A Falls

Percent Coverage: 20%, flow precluded access to north bank.

Vantage point photos: 2:00 to 4:00 p.m.

Number of stranded fish: 4 fish all alive including 3 landlocked salmon parr

Number of stranded invertebrates: >55 live macro-invertebrates including >50 stonefly nymphs, 3 crayfish, 1 Isonychia nymph, and 1 leech

Number of stranded others: 11 live minnows

Narrative: The team arrived at the reach at 1:30 p.m. and took vantage point photos at 15-minute intervals until 4:00. Shortly after 4:00, we moved from the vantage point noting 3 stranded parr flopping on the rocks, which we assisted back into the main channel. We doubt these individuals would have survived if low flows were maintained. We moved as far upstream as possible, noting a larger fish stranded in a backchannel that we could not access to photograph. Stranded crayfish, parr, and stoneflies were observed in small pools formed from dewatering. The most abundant order observed in the study area were stoneflies in the form of nymphs; we observed over 50 individuals in the study area. We departed the area at 5:15.

## Attachment LL

### Vantage Point Sequence

**Time**

**2:14**



**2:45**



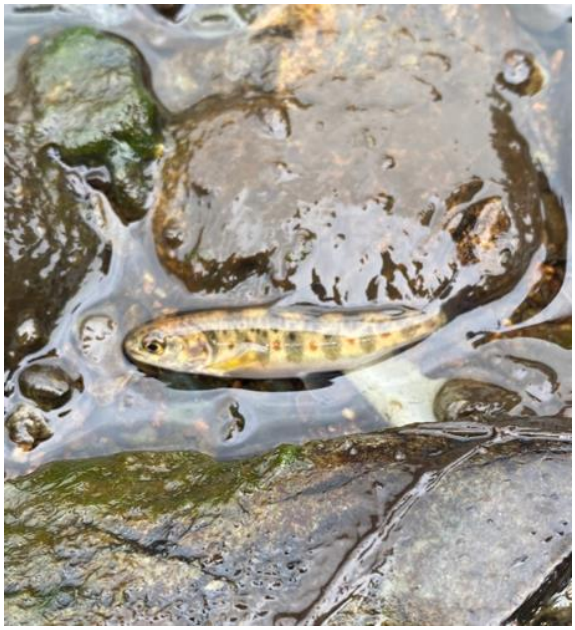
**3:45**



**4:00**

## Strandings

Selected photos, additional available at https://drive.google.com/drive/folders/12XpqDYLXgTOrDfkKVU7wC064_j2ANtbb?usp=drive_link



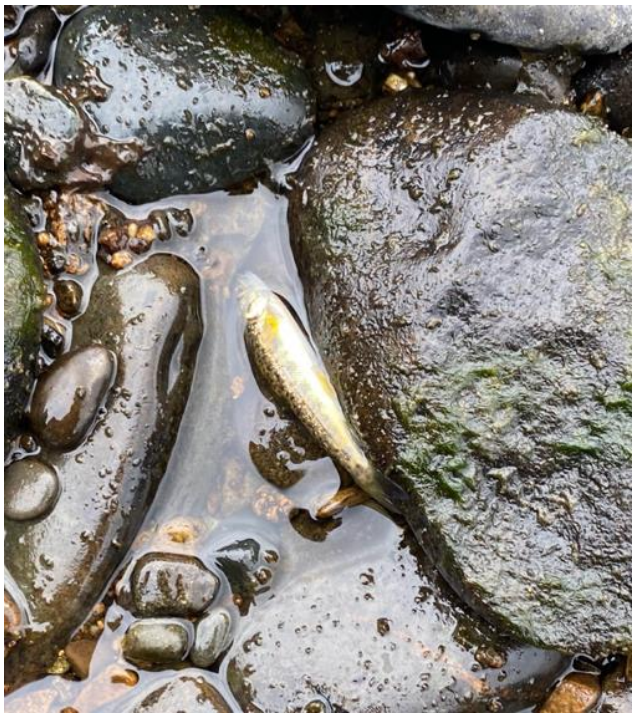
Stranded salmon parr



Stranded stonefly nymph

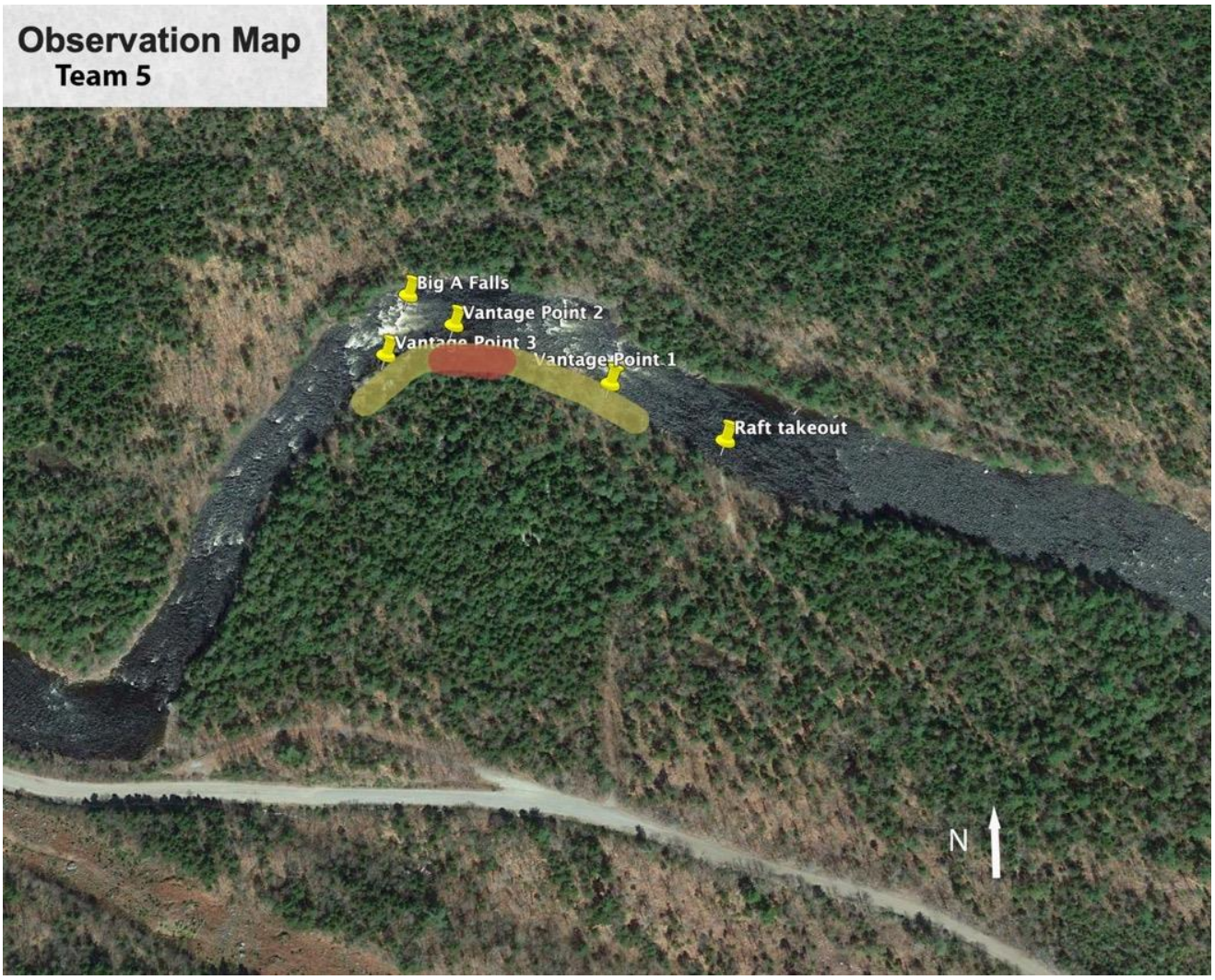


Stranded Isonychia nymph



Stranded salmon parr

## Attachment MM




| |
|---|
| yellow: coverage area, red; previous high stranding area |

## Attachment NN

Debrief Sheet – Team 5

Team Members: Rory Hannon and John Singletary

Reach: Big A Falls

Percent Coverage: 100%

Vantage point photos: 2:00 to 6:15

Number of stranded fish: 4 – 2 alive, 2 dead

Number of stranded invertebrates: many crayfish and stonefly nymphs

Number of stranded others: 1 live minnow

Narrative: The team arrived at the vantage points at 2:00 p.m. to observe drawdown. Sat at vantage point for 1 hour. At 3:00, began looking for strandings. Hiked to Big A access (west extent of reach). Hiked back along the river and observed strandings in isolated pools between Big A Falls on the southbank. Observed 2 brook trout, 1 salmon YOY, and 1 minnow stranded in among the rocks. Crayfish and other macro-invertebrates especially stonefly nymphs too numerous to count. Covered entire reach, departed at 6:15.

## Attachment OO

### Vantage Point Sequence



## Strandings

Selected photos, additional available at https://drive.google.com/drive/folders/17YkbIl5raYwGljE8R-TZtTajd8UuIdGp?usp=drive_link



Dead salmon parr



Stranded crayfish



Stranded salmon parr



Dead salmon parr

## Attachment PP

Selected photos, additional and video available at https://drive.google.com/drive/folders/1-Q_PO8FL0J9O_n_U-ktJ-F7cLqjjDq3o?usp=drive_link

Maine Guide Todd Mercer made observations in the area of the McKay Station turbine discharge by kayak. The results were again striking with 20 salmonids trapped behind a bolder wall across from the most upstream of the turbines. Had the low flows, these would likely have mostly become mortalities. Photos follow, video is available online. These still images are taken from the movies, the movie video available at the link above is much better.



Stranded adult landlocked salmon



Multiple nymph and insect larvae

## Attachment QQ

Selected photos, additional and video available at https://drive.google.com/drive/folders/1HqPUxZFyzdL-UfphIR92_B_9aeEZ29my?usp=drive_link and video at https://drive.google.com/drive/folders/18ptw1ePxVbwc0OqXgzFAw5-p8xq55WJP?usp=drive_link starting at 6:20 run time

Miles Puleio and Chris Howe traveled downstream by kayak from McKay Station to the Big Eddy. Miles documented stranded and dead fish, minnows and macroinvertebrates. Stranding locations seemed dependent on microtopography. Chris Howe Provided additional video.



Stranded salmon parr



Dead white perch



Stranded minnows



Stranded sculpin

## Overall Conclusions

The observations conducted by TU teams deployed during the Stranding Study conducted October 5, 2022 demonstrate that significant stranding and mortality occur downstream from McKay Station when flows are reduced from whitewater flows to generator trip event flows of ~500 cfs. While stranding decreased in either of the Ramping Study flow scenarios of July 17 and July 24, 2024, the stranding rates experienced when flows decrease from ~2400 cfs to ~1000 cfs are less but similar to the more drastic reduction of from 3600 cfs to 1000 cfs. Lingering effects from the July 17 event could be a factor in the results of July 24. It should be noted that Team 2 found no strandings during the event of July 24, when the July 17 counterparts did; Team 3 found many more stranding during the July 24 event than it did during the July 17 event: and, the area at McKay where over 40 salmonids were discovered stranded saw about half the strandings that occurred on July 17. Variation in the number of strandings between events could be based on any number of factors. Without a multi-year study, it is difficult to identify specific causes.

The stranded fish documented in the study would likely have become mortalities had the low flow conditions persisted. The study event was conducted nearly three months earlier in the year than the Stranding Study, and the smaller-sized salmonid parr may have been in different locations or affected differently. Accurate comparisons are impossible, and the key unanswered question is why so many fewer salmonid parr were found. Stranded caddis larvae were abundant in Ripogenus Gorge and suffer high mortality any time flows drop below 1000 cfs in any scenario. The waterline established by nominal 2000 cfs summer flows was visible, and mortality to these larvae would start to occur when flows go below that line and increase exponentially with lower flows. A safe minimum flow still needs to be determined that is more than 1000 cfs in the current license. Even the 1422 cfs spawning and incubation flows in the current license need to be studied.

During the July 17th and July 24th ramping studies. TU volunteers documented rapid surface water declines over very short time periods, less than an hour. The flow reduction on the 17th was from 3600 cfs to 1035 cfs or a 70% reduction in channel flow. Changes in flows were observed to have stabilized at most sites within an hour of the initial reduction.

The flow reduction on the 24th was a two-step reduction. The first step at 2:00 pm was from 3600 cfs to 2400 cfs or a 34% reduction in flow. The second step at 3:00 pm was a 2400 cfs to 1000 cfs step or a 59% reduction in flow. Again, TU team observations indicated channel water levels stabilizing approximately 1 hour after each flow change. Although Brookfield called this a “Ramping Study” and we have continued to use that title to avoid confusing it with the 2022 Stranding Study, it was not a true ramping study using the methodology of Smokorowski et al. as it did not incorporate gradual step downs of flow and it did not collect data on resultant macroinvertebrate drift. A true ramping study still needs to be conducted to inform the relicensing.

There is a considerable body of literature that discusses the effect of water level changes on riverine ecosystems Hayes et al. 2024, Smokorowski et al. 2011, Irvine et al. 2015, Lewis and Healy, 2012. The papers focus on Peaking Operations vs Run-of-the-River (“Natural flow”). The primary ways that

ramping rates are evaluated are by 1) Vertical Ramping speed -drop in water level per hour, 2) Lateral Ramping speed- the lateral retreat of water across the wide, flat gravel bars, 3) Percent change in Channel Volume. The vertical ramping rate standard used by DOF is presented in Cathcart 2005 (Table 6.3 duplicated below from Cathcart, 2005). These references are listed at the end of the document.

Knight Piésold CONSULTING

**TABLE 6.3**

**FISHERIES AND OCEANS CANADA**
**FLOW RAMPING STUDY**

**STUDY OF RAMPING RATES FOR HYDROELECTRIC DEVELOPMENTS**
**SUMMARY OF WASHINGTON RAMPING RATES STANDARDS**

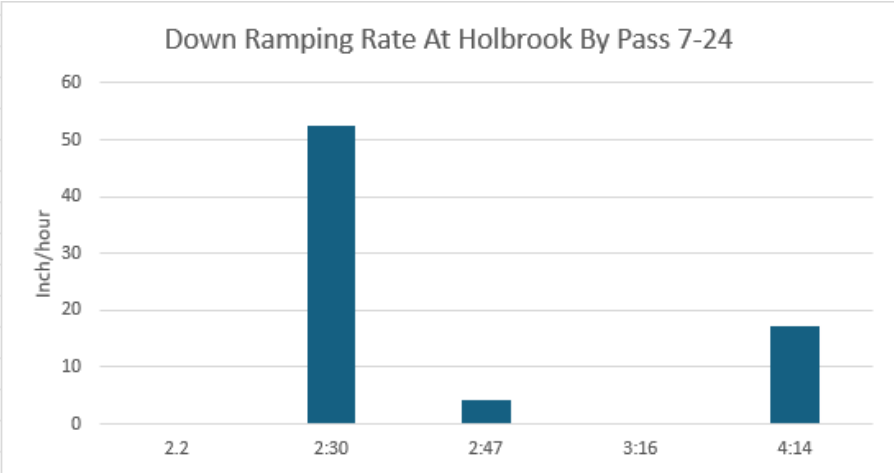
Print Jun/27/05 13:41:01
M:\1\03\00079\02\A\Data\[RampingGuidelines.xls]Table 6.3 rA Rev'd Mar/24/05

| Time of Year | Life Stage History | Day Ramp Rate | Night Ramp Rate |
|---|---|---|---|
| February 16 to June 15 | Salmon Fry | No Ramping | 2 inches/hour |
| June 16 to October 31 | Steelhead and Trout Fry | 1 inch/hour | 1 inch/hour |
| November 1 to February 15 | Not Indicated in Standards | 2 inches/hour | 2 inches/hour |

**Notes:**
1) Ramp rate refers to change in stage.

Observations and photographs captured the water level changes from the stadia rod installed at Holbrook Bypass observed on July 24th. These Stadia Readings were listed with photo times in Attachment BB.

The times and water height readings were converted to Vertical Down Ramping Rates and are presented in the figure below. As can be seen the Vertical down ramping rates were 25 times higher than what recommended as a standard by DOF Canada.




Smokorowski et al. 2011, showed that there are operational ways to minimize the effects of down ramping on the river system: “The combination of reduced ramping rate and minimum discharge appeared to conserve invertebrate abundance and diversity, fish biomass, fish condition, and food web length.”

There are flowage rules that could be required that could significantly improve the biotic integrity of the W. Branch Penobscot. Cathcart (2005) presented the Canadian Department of Oceans and Fisheries flow standard in this publication and reviewed how various turbines could be operated to comply with their operational flow restriction standards. Smokorowski et al. 2011 suggests an operational rule that flows should be reduced by no more than 25% of the previous hour's flow. Overall, these requirements to moderate the rate that flows change will require changes in operational procedures (Lewis and Healy) and may result in some loss of generation capacity. 2-D hydrological modeling can identify the river sections that are spawning and rearing areas susceptible to dewatering and determine surface elevations/minimum flows needed to protect these areas.

## Recommendations

TU recommends that FERC require a 2-D hydrological study (per Smokorowski et al. 2011) to define minimum flows that will keep lateral bars inundated to protect juvenile salmonids and aquatic invertebrates and to define the parameters of safe flows between 1000 and 2000 cfs. While the abrupt flow decline of the Ramping Study does demonstrate the potential for significant fauna losses, it did not demonstrate what the impacts of true ramped flow decline would be. While the study clearly shows how not to reduce flow, it is a start for determining the future flow regimes based on further study. Given the abundance of literature on ramping flows, it would be reasonable to explore how to incorporate one the several systems that have been found to minimize injury to riverine biota. The use of set vertical inches/hour flow reduction or previous hour's flow percentage reduction are options, both are systems easy to use and for documenting compliance when a USGS gage is on the system.

**Ramping Study References:**

Cathcart, J. 2005. Fisheries and Oceans Canada flow ramping study: study of flow ramping rates for hydropower developments. Consultants' report prepared by Knight Piesold Ltd. for Fisheries and Oceans Canada. (ref. No. Va103-79/2-1), 50 pp.

Irvine, R. L., Thorley, J. L., Westcott, R., Schmidt, D., & D. DeRosa. 2015. Why do fish strand? An analysis of ten years of flow reduction monitoring data from the Columbia and Kootenay rivers, Canada. River Research and Applications, 31(10), 1242-1250.

Lewis, A, and Healey, 2016. Managing flow ramping operations at run-of-river hydroelectric projects. Ecofish Research Ltd for Clean Energy BC, Department of Fisheries and Oceans Canada, and the BC Ministry of Environment.

Lewis, A., C. Zyla. and P. Gibeau, 2011. Flow Ramping Guidelines for Hydroelectric Projects: Developing, Testing, and Compliance Monitoring. Consultant's report prepared by Ecofish Research Ltd for Clean Energy BC, Department of Fisheries and Oceans Canada, and the BC Ministry of Environment.

Smokorowski, K. E., R. A. Metcalfe, S. D. Finucan, N. Jones, J. Marty, M. Power, R. S. Pyrce and R. Steele. 2011. Ecosystem level assessment of environmentally based flow restrictions for maintaining ecosystem integrity: a comparison of a modified peaking versus unaltered river Ecohydrol. 4, 791–806 (2011) DOI: 10.1002/eco

Ms. Debbie-Anne Reese
September 12, 2024
Acting Secretary Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Subject: Project 2572. A Response to FERC Staff's September 5, 2024 Filing: Determination on Requests for Study Modifications and New Studies

Dear Secretary Reese, VIA Electronic Filing

Current FERC policy/regulations appear to encourage public participation in licensing processes. Given this reasonable interactive policy, it seems unreasonable to require a lay population to adhere to a strict set of legal standards. Moreover, material presented in Appendix C of the above referenced filing not only holds the public responsible for meeting difficult legal and policy standards, but in this case, ignores the history of the existing FERC Project 2572 1996 License.

The following text deals with the history of the Ripogenus 1991-1996 Licensing process and the very limited current fish and aquatic communities' information provided in the ongoing licensing process. The end point of these arguments is that the Licensee has not demonstrated the adequacy of an artificially imposed West Branch of the Penobscot River (West Branch) spawning and incubation Aquatic Based Flow (ABF) coupled with the impact of the current, highly variable, peaking operation.

In their reply comments, the Licensee makes a number of statements that are either irrelevant or simply unfounded. In maintaining the theme that nothing has changed with the shift to peaking operation, the Licensee provides no in-situ West Branch fisheries evidence to support their position. In fact, current limited West Branch fisheries data show a Landlocked salmon (salmon) fishery in precipitous decline.

In an attempt to prove the adequacy of the ABF 1422 cfs West Branch spawning and incubation flow, the Licensee cites zone of passage study results. The ability of a fish, salmon in this case, to move up and down a river reach, has zero relationship to spawning success in the West Branch downstream of McKay Station. To use Zone of Passage in the context of a spawning flow demonstrates the futility of the Licensee's arguments and the weakness of their case.

The Licensee continues that 1000 cfs flow “supports resident fish species”. How 1000 cfs related to the ABF question is unclear. This unsupported statement and any low flow (less than1800 cfs) number is refuted by the scant 2022-2023 study results (fish assemblage studies) and information (2022 and 2023 salmon age growth data) provided by the stakeholders. Limited fisheries (and aquatic communities) data clearly demonstrate that the current salmon population is not meeting MeDIFW goals. Salmon spawning and incubation success is a major component of the West Branch fisheries management.

In their reply comments, the Licensee seems confused with the origin and purpose of ABF recommendations. ABF is a generic prescription of flows developed from unregulated streams that is then applied to regulated streams. As the then Great Norther Paper Mills needed constant, stable base flows, no thought was given to the possibility of a highly disruptive, current peaking operation. Most importantly, when important flow prescriptions are agency or FERC mandated, post license issuance studies are required to ensure the adequacy of the flow requirement. FERC required such studies for the Holbrook Bypass spawning Channel (Article 406) . However for the reason stated above, constant moderate base flows e.g., 2400 cfs, not for the 1422 spawning and incubation flow. The adequacy of this (artificial) ABF flow remains unknown.

The Licensee’s reply comments continue, “GLHA notes that the spawning and incubation flows included in the existing license were based on 10 years of field observations by professional fish biologists.” The Licensee is referring to studies that I conducted during a period when stable 24x7 base flows were required for paper production. Ironic, isn’t it? To repeat earlier comments, there were NO STUDIES that dealt with proposed 1422 cfs spawning and incubation flow. If the Licensee believes such a study results exist, they should produce summary reports or the field data sheets.

During the FERC staff *Discussion and Recommendation* section, they cite the adequacy of general ABF recommendations. I agree with FERC staff that in the absence of empirical date, ABF is a possible “starting point”. It is difficult to understand how a generic flow can be declared anything other than a starting point without supporting information. FERC calls the existing ABF conservative [section 5.9(b)(5)]. Environmental laws and policy generally require that the action errs on the side of the resource. Whether “conservative” refers to the volume of flow or protection of the yet to be confirmed spawning (and incubation) locations is not stated. Without in-situ data, the ABF impacts either positive or negative remain unknown.

FERC staff notes that this study request was not made earlier [section 5.15(e)(3)]. Without information e.g., salmon age growth, outage studies, or Ops model iterations presented during the last two years, such a request would have been baseless. It seems unfair to encourage public participation and then deny participants the opportunity to request study(s) once they have reviewed (limited) information collected during a two plus year period of FERC or Maine Department of Environmental Protection required studies.

FERC staff referenced costs. Compared to monies spent on North Twin Impoundment tributary access, West Branch stranding and “ramping” studies the cost of 1422 cfs spawning study is de minimis. The suggested study requires a two person crew, on site for several hours, with a repetition several weeks later. Surely a multinational conglomerate can afford this relatively inexpensive cost.

Thank you for the opportunity to respond to the critical issue of flows, including spawning and incubation flows. I request that FERC staff understand the lay person’s limitations as stakeholder attempting to deal with complicated protocols and regulations imposed by a complex licensing process. The fact that stakeholder requests, including my filings, fail to meet stringent formatting requirements, should not be an excuse for automatic dismissal. The future of West Branch fish and aquatic communities is at stake. Please reconsider your ruling.

Ed Spear

307 Mt. Hope Ave.
Bangor, Me 04401
Phone 207-217-4288
Email: edspear1@yahoo.com

September 14, 2024

Debbie-Anne A. Reese
Acting Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Electronically Filed**

**RE: Ripogenus Project (FERC P-2572) and Penobscot Mills Project (P-2458)**
**Second Request for Operations Model Run**

Dear Secretary Reese:

The following request for a second Operations Model run for the Ripogenus Project (P-2572) and Penobscot Mills Project (P-2458) is submitted on behalf of members of the Caribou and Chesuncook Camp Associations. The overall results of our initial Ops Model Run request were favorable; the attached proposed model run builds on those results. We greatly appreciate FERC continuing this iterative modeling process during the licensing application period.

**Introduction**

The purpose of this submittal is twofold: (1) to request, for a second time, that our preferred Ops Model scenario be run exactly as originally submitted, and (2) to request that the derivation of elevation 939.00 as "target full pond elevation" be substantiated by actual data and/or an Ops Model simulation.

We would like to thank the Licensee (GLHA) and their consultant (HDR) for preparing and conducting the virtual conference call on July 10, 2024 in which the *Operations Model – Alternative Scenario Results* were presented. Following that conference call and a review of comments submitted to FERC on the Updated Study Report, the Camp Associations have developed a single Operations Model Alternative Scenario request which follows this letter.

The system operation has changed markedly over the last 10 - 15 years, and the environmental impacts have been documented in numerous submittals during this ILP process. Simply put: under GLHA's operation the average summer lake drawdown has increased dramatically with profound impacts.

For the Camp Associations, the overall purpose of the proposed *Alternative Scenario* submitted herein, and the operations modeling in general, is to demonstrate that an operating model which emphasizes stable water levels, is possible, has been attained in wet, dry and average weather years, and is a preferable and sustainable approach.

**The Operations Model Purpose**

It is important to view the CHEOPS model output results for this project in the proper context. GLHA has stated that they will not be using the CHEOPS model for future operational purposes. The model was developed solely for relicensing projects, is essentially being used as a mediation tool, and will not be used in the future as an actual "operations model". In that light, the following quotes from the Technical Workshop presentation should be kept in mind when interpreting the scenario results, and scenario requests:

> *"...accuracy is highly dependent on input data; consequently, Operations Model results should be viewed in a relative, rather than an absolute, context."*
>
> *"Goal of model runs is to weigh the relative impact from one scenario to another."*
>
> *"Purpose of the Model is not to mimic actual operations but rather to reasonably characterize system operations and evaluate effects of alternative operating scenarios."*
>
> *"..it must always be foremost in model discussions that the Operations Model should be used to assess the relative impacts between scenarios. What this means is model verification is the only time it is appropriate to compare Operations Model results with historical data."*

**Initial Operations Model Results**

A total of 15 model request scenarios were submitted to FERC by various parties in March 2024, evaluated by GLHA/HDR, and presented in a spreadsheet in the Operations Model Study Report dated June 28, 2024. We have selected **Scenario 3** as the best option to present and further evaluate (1) the lake elevation schedules for Ripogenus and North Twin and (2) recreation flow requests.

**Scenario 3** included a new target elevation schedule for Ripogenus Lake, a slightly modified target elevation schedule for North Twin Lake, and a proposed reduced outflow (from 3,000 cfs to 1,500 cfs) from North Twin Lake under certain flow conditions. The proposed target elevation schedules were designed based on actual historical elevation data for Ripogenus Lake and North Twin Lake (predominantly using pre-2012 data for normal, wet and dry years) and represent more stable water levels with reduced drawdowns (in comparison to the current operating conditions).

Of the 15 model requests analyzed by HDR, **Scenario 3** appeared to be the only scenario run that showed the most positive results. As reported by HDR, the **Scenario 3** results compared to the BaselineR3 resulted in the following:

- higher Ripogenus Lake elevations most notably in the late summer/fall,

- lower minimum flows of 1,500 cfs from North Twin result in higher North Twin Lake elevations through the most significant drought and ability to maintain 1,500 cfs through almost the entire drought of 2001-2003,

- higher impoundment elevations in the fall result in increases in spill occurrences, (*These increases are minor. At Ripogenus only 2.8 more days more at most, occurring in the month of November with an average monthly increase of only 0.7 days. At North Twin the number of days of spill decreases or stays the same in nine months and only increases at most by 0.5 days occurring in October.)*

- scenario results in North Twin Lake elevations in August within 8 inches of the current license,

- the only scenario analyzed that does not impact recreational flows.

We are not surprised that the scenario works well – it is based on observed historical data!

The following 3 pages were submitted with the original **"Scenario 3"** request and describe the resources of interest, anticipated benefits, and success/benefit metrics.

Note: **Scenario 3** was the ID number assigned by HDR. The Camp Association originally submitted our two requests as Scenario 1 and Scenario 2 as shown on the following pages.

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| Caribou and Chesuncook Lake Camp Owners Association | **Scenario 1 Request** (Full Lake May 15th, 1 foot drawdown monthly June 1st to October 15th) |  |
|---|---|---|
| **Requested modification to the baseline scenario** | **Resources of interest and anticipated benefits** | **Success/ Benefit metrics** |
| *CURRENT:*<br><br>*No drawdown limits on Ripogenus Lake, Chesuncook Lake and Caribou Lake*<br><br>**PROPOSED:**<br><br>**Winter drawdown based on evaluation of snowpack, timing of spring thaw and forecasted precipitation to a full lake refill of 941.6 feet as conditions permit.**<br><br>**Winter drawdown will not exceed 16.5 feet or target elevation 925.1 on April 1 unless GLHA makes notification of a "wet year" condition on or after Feb. 15th.**<br><br>**A lake elevation of 940.1, (within 1.5 feet of normal full pond elevation) maintained until May 15th.** | Resource of Interest:<br>• Ripogenus Lake<br>• Caribou Lake<br>• Chesuncook Lake<br><br>Anticipated Benefit:<br>• Lakes are refilled every spring allowing for maximum storage in the recreational season<br><br>Feasibility:<br>• April 1st elevations at or above 925.1 occurred in 2000, 2006, 2007, 2009, 2010, 2011, 2012, 2021, 2022<br><br>• May 15th elevations at or above 940.1 occurred in 2000, 2005, 2007, 2008, 2010, 2011, 2017, 2018, 2019, and 2022 (includes wet, dry, and average years per Operations Data from 2000 to 2022)<br><br>• 1.5 feet below full pond allows for management of spring freshet | • Are the lakes reaching a full pond elevation of 941.6 feet and being maintained to at least 940.1 feet through May 15th?<br><br>• Is enough water maintained in the winter to fill the lakes in the spring?<br><br>• Are the lakes being refilled every spring?<br><br>• Do the lake elevations drop 1 foot per month from June 1st to October 15th? |
| **After June 1st, lake drawdown will not exceed 1 foot per month per the following "Target Elevation" schedule:**<br><br>**May 15 940.1**<br>**June 1 940.1**<br>**July 1 939.1**<br>**Aug. 1 938.1**<br>**Sept. 1 937.1**<br>**Oct. 1 936.1**<br>**Oct. 15 935.6** | Resources of interest:<br>• Loons - see Loon Study recommendations<br>• Access to Ripogenus Lake, Caribou Lake and Chesuncook Lake<br>• Bureau of Public Lands Campsites<br><br>Anticipated Benefits:<br>• Healthy loon populations thrive on the lakes<br>• Keeps boat launches usable during peak fishing season<br>• Provides sufficient water to maintain relatively stable lake levels throughout the recreational season. | • Is loon habitat being protected?<br><br>• Are boat launches and public campsites usable and accessible throughout the recreation season? |

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| | | |
|---|---|---|
| **After October 15th the lakes will be gradually lowered to a winter drawdown level no lower than elevation 925.1 (16.5 feet of drawdown) unless a "wet year" condition exists per GLHA notification** | • Mirrors stable lake levels as cited in the 1993 license application, **"Since 1972, … the average drawdown [during the summer recreational season (Memorial Day to Labor Day)] has been 3.5 feet."**<br><br>• Both boat launches are usable the entire recreational season. According to the Recreation Study, Caribou boat launch is usable above 936.7 and the Chesuncook Dam boat launch is usable above 931.9.<br><br>Feasibility:<br>• October 15th elevations at or above 935.6 occurred in 2006, 2008, 2009, and 2011.<br><br>• In 2014 the East Millinocket Mill permanently closed and the Millinocket Mill smokestacks were demolished. This ushered in a new era for the region, and for the energy produced - energy generated is sold to ISO. | • Is the lake elevation above 935.6 on October15th?<br><br>• Is safe navigation possible between the lakes?<br><br>• Is this State of Maine Statue being met:<br>Maine revised statute 38 636 pg. 3 Will the project result in significant benefit or harm to the public rights of access to and use of the surface waters of the State for navigation, fishing, fowling, recreation and other lawful public uses; [1983, c. 458, §18 (NEW).] |
| **North Twin Impoundment Model Inputs**<br><br>**Winter target elevation on April 1 should be set at 479.42 (12 feet drawdown).**<br><br>**Use this "Target Elevation" schedule:**<br><br>**Jan. 1 482.0**<br>**Feb. 1 480.0**<br>**April 1 479.4**<br>**May 1 488.7**<br>**May 10 490.4**<br>**June 1 490.4**<br>**July 1 490.4**<br>**Aug. 1 489.9**<br>**Sept. 1 489.0**<br>**Oct. 1 488.6**<br>**Nov. 1 486.0**<br>**Dec. 1 484.0** | Resource of Interest:<br>• North Twin Lake<br>• South Twin Lake<br>• Pemadumcook Lake<br>• Ambajejus Lake<br>• Elbow Lake<br><br>Anticipated Benefits<br><br>• Meets current license Article 408 which states in part that water level: "…*shall be maintained at a relatively stable level from May 1 through August 22 annually, and at a minimum target level of 488.42 feet USGS (3.5-foot drawdown) for the period August 22 through October 15."*<br><br>Feasibility:<br><br>• The lakes have operated close to this scenario since 1996 | • Does the target elevation schedule achieve the lake elevations stipulated in the current license? |

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| Caribou and Chesuncook Lake Camp Owners Association | **Scenario 2 Request** (combined with all elements of Scenario 1 and reduce outflows at Shad Pond to 1,500 cfs) | Page 1 of 1 |
|---|---|---|
| **Requested modification to the baseline scenario** | **Resources of interest and anticipated benefits** | **Success/ Benefit metrics** |
| **Current:** *A minimum flow of 3,000 cfs from the North Twin Development is provided from August 22 through October 15, as long as the impoundment elevation exceeds 488.42 feet. Otherwise, approximately 2,000 cfs is typically released from the North Twin Development to meet the minimum flow requirement of 2,000 cfs at Shad Pond, which is located downstream of the Millinocket and Millinocket Lake Developments*<br><br>**Requested:** ***A minimum flow of 3,000 cfs from the North Twin Development is provided from August 22 through October 15, as long as the impoundment elevation of North Twin exceeds 488.42 feet and the Ripogenus Lake elevations meet the requirements of Request 1. Otherwise, approximately 1500 cfs is typically released from the North Twin Development to meet the minimum flow requirement of 1500 cfs at Shad Pond, which is located downstream of Millinocket Dam and Millinocket Stream*** | Resource of Interest:<br>• Ripogenus Lake<br>• Caribou Lake<br>• Chesuncook Lake<br>• Ambajejus Lake<br>• Pemadumcook Lake<br>• North Twin Lake<br>• South Twin Lake<br><br>Anticipated Benefits<br><br>• Ensure relatively stable lake levels throughout the recreational season in **both** the North Twin and Ripogenus Developments.<br><br>• This minimum flow requirement was originally put in place to ensure water quality standards were met due to effluent from the Millinocket and East Millinocket mills and town waste water. Since the two mills are no longer operating, a lesser flow below Shad Pond will likely meet water quality requirements. | • Are lake levels being maintained that are **beneficial to fisheries, and wildlife**, ensure **boating and recreational safety,** and provide **recreational access**?<br><br>• Are Bureau of Public Lands **campsites accessible and safely usable**?<br><br>• Do the actual water elevations at Ripogenus Dam and North Twin Dam match the schedule prescribed in Scenario 1 herein? |
| | | |

**Original Operations Model Run Request was Altered**

There was only one problem with the scenario HDR ran – they changed the springtime high water target elevation for Ripogenus from 940.1 (1.5 feet below spill crest) to 939.00 (2.6 feet below spill crest). This change was not requested. Given that our original request (which we consider a verification comparison to historical data that predates this new 939.00 target elevation) was not honored, we are making the request again.

**Second Request for Operations Model Verification Run**

Attached to this letter is a second request to **run Scenario 3 as originally submitted** with the target full pool elevation set at 940.1 on 5/15 and 6/1 only**.** This scenario result will allow a direct comparison to historical observed data and will help to establish model verification, bearing in mind that "*model verification is the only time it is appropriate to compare Operations Model results with historical data."*

The attached **Scenario 3** Operations Model also contains several proposed revisions from the initial run. The North Twin Lake winter drawdown has been reduced per DIFW guidance. The monthly target elevation schedule also has listed elevations for each month.

**Recreational Flows Determined to be Outside the Ops Model**

Several periodic releases for whitewater and/or fisheries have been proposed. Based on the flow rate and duration, it is our opinion that these flows, if run in a subtractive manner (reduce flow from McKay by equal amount to maintain recreational flow at a constant rate), will not significantly impact lake levels and can be excluded from this requested Ops Model run. To quote the Ops Model report: "*Operations Model results should be viewed in a relative, rather than an absolute, context."*

**Ripogenus Target Full Pond Elevation at 939.00**

The Operations Model sets the "Target Full Pond Elevation" for Ripogenus at 939.00 (2.6 feet below the actual full pond elevation of 941.59 (say 941.6)). Although we understand that the model allows the water elevation to exceed elevation 939.00, no data, simulations or text have been included to support the need for 2.6 feet of freeboard. Our model scenario set the target elevation at 940.1 (allowing 1.5 feet of freeboard).

**Request for Technical Justification for Target Full Pond Elevation at 939.00**

GLHA has recently adopted elevation 939.00 as the "working pool elevation" for Rip Dam. We assume that the Emergency Action Plan is based on Ops Model scenarios, or other calculations, that demonstrate the need for 2.6 feet of freeboard as a Public Safety necessity during the springtime ice-out/freshet. Please provide this documentation. Establishing a lower full pond elevation, and effectively eliminating substantial littoral zone and two billion or more cubic feet of storage, should be an informed decision based on data that lead to a defensible elevation

number. No data has been presented to support elevation 939.00 as the "working pool elevation". The CHEOPS model should be used to simulate whatever catastrophic storm GLHA is planning for that would require 2.6 feet of freeboard. We are in favor of public safety measures implemented to mitigate climate change impacts, provided they are based on sound engineering and planning.

Thank you for considering these comments.

Respectfully submitted,

Michael J. Hudson, Hydrogeologist, Member
Caribou and Chesuncook Lake Camp Associations

Bill Houston, Spokesperson
Caribou and Chesuncook Lake Camp Associations

Attachment: Request for Operations Model Run

**REQUEST FOR OPERATIONS MODEL RUN**

**Original Scenario No.: 3**
**Original Scenario ID: RipNTwinElevLev1MinInst (with minor revisions)**

- **Ripogenus Lake Elevation:**
  - Winter drawdown lower limit to be elev. 925.1 on 4/1
  - Target Lake Elevations
    - 1/1 929.6
    - 2/1 927.1
    - 3/1 925.1
    - 4/1 925.1
    - 5/1 935.0
    - 5/10 940.1
    - 6/1 940.1
    - 7/1 939.1
    - 8/1 938.1
    - 9/1 937.1
    - 10/1 936.1
    - 10/15 935.6
    - 11/1 934.1
    - 12/1 932.6

- **North Twin Lake Elevation:**
  - Winter drawdown lower limit to be elev. 482.0 on 4/1
  - Target Lake Elevations:
    - 1/1 483.0
    - 2/1 483.0
    - 3/1 482.0
    - 4/1 482.0
    - 5/1 488.7
    - 5/10 490.4
    - 6/1 490.4
    - 7/1 490.4
    - 8/1 489.9
    - 9/1 489.0
    - 10/1 488.6
    - 11/1 486.0
    - 12/1 484.0
    -

- **North Twin Minimum Flow:**
  - From 8/22 – 10/15 provide 3,000 cfs as long as North Twin elevation is >488.42 feet and Ripogenus Lake elevation meets above criteria; otherwise, provide 1,500 cfs during this period and remainder of year.