Brookfield
Renewable N.A.

January 30, 2026

VIA ELECTRONIC SUBMITTAL

Laura Paye
Hydropower Coordinator
Maine Department of Environmental Protection
Bureau of Land Resources
17 State House Station
Augusta, ME 04333-0017

Subject: **Ellsworth Hydroelectric Project (FERC No. 2727)**
Response to Comments on Application for Water Quality Certification
MDEP Application #L-13256-33-M-N

Dear Ms. Paye:

On June 18, 2025, Black Bear Hydro Partners, LLC (Black Bear) submitted an application for Water Quality Certification (WQC) for the Ellsworth Hydroelectric Project (FERC No. 2727) (Project) to the Maine Department of Environmental Protection (MDEP). Black Bear is submitting this letter to MDEP to provide responses to comments on the WQC application by the Maine Department of Marine Resources (MDMR), dated August 8, 2025.

The Project, which consists of two developments – the Ellsworth Development and the Graham Lake Development – is located on the Union River in the City of Ellsworth, the Towns of Waltham and Mariaville, and the Township of Fletchers Landing in Hancock County, Maine.

On March 19, 2020, the MDEP denied the original WQC application, which Black Bear had submitted on March 21, 2019. The June 18, 2025 WQC application included two notable changes from Black Bear's previous proposal: modifying the operating regime in Graham Lake and a water quality enhancement program for Lake Leonard. These changes were proposed to improve water quality at the Project to address the issues identified by MDEP in the WQC denial (specifically, to improve the macroinvertebrate community in Graham Lake and in the Union River downstream of Graham Lake Dam, and to improve dissolved oxygen levels in Lake Leonard) and were developed in consultation with the MDEP.

MDMR's August 8, 2025 comments did not pertain to Black Bear's June 18, 2025 WQC application, which focused solely on measures to address MDEP's reasons for denying the original WQC application; instead, MDMR's comments focused on passage for anadromous fish species and catadromous American eels at the Project's two dams. Fish passage had been previously addressed during the Federal Energy Regulatory Commission (FERC or Commission) relicensing process, as reflected in Black Bear's Final License Application (FLA) filed on December 30, 2015,

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FERC's Final Environmental Assessment (FEA) issued on July 29, 2019, and the U.S. Department of Commerce's and U.S. Department of Interior's Section 18 Fishway Prescriptions (FERC FEA, Appendices C and D, respectively).

Attached to this letter is Black Bear's responses to the comments in MDMR's August 8, 2025 letter.

If there are any questions regarding this submittal, please contact me by phone at (207) 755-5605 or by email at randy.dorman@brookfieldrenewable.com.

Sincerely,

Randall Dorman
Senior Manager, Compliance - New England and Rest of Country (LA, NC, TN)
Brookfield Renewable N.A.

Attachment:
Responses to MDMR August 8, 2025 WQC Application Comments

Responses to MDMR August 8, 2025 WQC Application Comments

1. Update to diadromous fish restoration priorities for the Union River

MDMR comment

MDMR states that it has updated diadromous fish restoration priorities in the Union River:

> p. 2 – "Since 2018, the State of Maine has updated its diadromous fish restoration priorities for the Union River, including inclusion of all indigenous sea-run species, the development of new river-specific population targets, and increased protection efforts for endangered Atlantic salmon under the Gulf of Maine DPS."
>
> p. 3 – "Since 2018, new scientific tools, federal standards, and watershed-specific goals have emerged that warrant substantial updates to MDMR's recommendations for the Ellsworth Project. MDMR has expanded its diadromous fish restoration priorities and developed species-specific performance standards using life history models like anadrofish. These models demonstrate that high passage efficiency and minimal delay at both Ellsworth and Graham Lake dams are essential to meet restoration targets."
>
> p. 6 – "The 2015 Comprehensive Plan referenced above expired in 2017 with the expiration of the FERC license for the Ellsworth Project. Since then, MDMR has updated its goals for the watershed to include additional historical habitat for alosines and sea-lamprey."
>
> p. 7 – "The Union River is currently stocked with Atlantic salmon fry and an April 2025 multi-agency plan[20] calls for the development of a stock rebuilding and management plan for the Union River and use of the West Branch Union River as a Genetic Refuge Area (GRA) to both increase the distribution and abundance of a selected stock and as a way to spatially separate lifestages within the stock."

Black Bear response

The nearly completed Ellsworth Project FERC relicensing reflects a thorough process, where Black Bear adapted its fish passage proposal to be consistent with the Section 18 fishway prescription from the U.S. Department of Commerce (Commerce; i.e., the National Marine Fisheries Service [NMFS]) for Atlantic salmon, which would also benefit other anadromous fish species; a new FERC license for the Project would also require implementation of American eel passage requirements contained in the U.S. Department of Interior's (Interior, i.e., U.S. Fish and Wildlife Service [USFWS]) Section 18 fishway prescription.

MDMR references that the *Comprehensive Fisheries Management Plan for the Union River Drainage 2015-2017* (Union River Fisheries Coordinating Committee [URFCC][1] 2015) expired

[1] The URFCC included the USFWS, MDMR (formerly including the Maine Atlantic Salmon Commission), Maine Department of Inland Fisheries and Wildlife (MDIFW), City of Ellsworth, Union River Watershed Coalition, Union Salmon Association, the Maine Council of the Atlantic Salmon Federation, Black Bear, and interested members of the public.

in 2017 and that, since 2018, the agency has developed new fish restoration priorities, including watershed-specific goals for the Union River. Historically, the Project's fish passage facilities have been managed and operated in consultation with the relevant fisheries agencies through the *Comprehensive Fishery Management Plan (CFMP) for the Union River Drainage*, which was updated every five years.

In 1997, a group of agencies and interested parties (including the USFWS and MDMR) signed an agreement for the purposes of addressing interim and long-term fisheries management in the Union River drainage, including the provision of fish passage at the Ellsworth Hydroelectric Project (URFCC 2015). The stakeholders adopted the following Mission Statement (URFCC 2015):

> It is the goal of the Union River Stakeholders Group to achieve timely and effective restoration and/or management of populations of resident and self-sustaining diadromous fish in the Union River watershed, consistent with a comprehensive fishery management plan, and in a manner that balances the interests of the public, regulatory agencies, and the licensee of the Ellsworth Hydroelectric Project.

The URFCC stakeholders agreed that they would develop a comprehensive, biologically-based plan to support fisheries management decisions for the Union River (URFCC 2015).

The CFMP identified agency goals and objectives for diadromous and resident fish populations in the Union River drainage and described the various tasks and responsibilities related to the restoration and management of those resources, including stocking, habitat assessment, population monitoring, and fish passage.

The prior management plan expired eight years ago, and Black Bear is not aware of any new management plan developed by MDMR that contains the updated restoration priorities and goals that form the basis of MDMR's current fish passage requirements. If such a plan exists, it is unclear under what authority or through what process MDMR developed it; it is unclear, for example, whether input was solicited from former members of the URFCC. To date, Black Bear has not been contacted regarding the development of any new plan.

Additionally, MDMR references plans for development of an Atlantic salmon stock rebuilding and management plan. Requirements for fish passage need to align with fish management objectives that build off the past management history for the basin and that are part of an active fish restoration strategy. The Union River fisheries management has had a history of collaboration via the URFCC, and MDMR appears to have foregone this collaboration to instead proceed with various, apparently private, in-house analyses and newly inspired department-specific goals.

Black Bear developed the revised WQC application specifically to address macroinvertebrate and dissolved oxygen issues identified by MDEP in the prior WQC denial. Yet MDMR, in its

August 8, 2025 comments, has chosen to reopen discussion of fish passage measures resolved during the relicensing process. Fish passage was not a factor in MDEP's denial of Black Bear's first WQC application, nor did MDMR previously raise many of its fish passage concerns during the now-decade long FERC process.

MDMR was an active and collaborative participant throughout the relicensing of the Ellsworth Project and afforded ample opportunity to propose license conditions. Section 10(j) of the Federal Power Act (FPA) requires FERC to include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, or enhancement of fish and wildlife resources affected by the project, provided they are consistent with the FPA or other applicable law. MDMR filed timely 10(j) recommendations on March 27, 2018 that were reviewed and analyzed in FERC's subsequent Draft Environmental Analysis. FERC flagged two of MDMR 10(j) recommendations as inconsistent with the FPA[2] but proposed alternative conditions to address other MDMR concerns. On January 16, 2019, MDMR responded to FERC, stating that the alternative recommendations described in the DEA were acceptable. Although MDMR continued to disagree with FERC's findings regarding fishway effectiveness testing measures, MDMR did not request a meeting or teleconference to discuss its rejected section 10(j) recommendations.

It would turn the licensing process on its head to now impose measures that were dutifully considered and rejected by the lead federal agency for the relicensing, just as it would to impose new and different fish passage measures, measures that resource agencies had not requested during the FERC relicensing process (*e.g.*, FERC's July 29, 2019 FEA, the Commerce and Interior fishway prescriptions [attachments of the FEA], and Black Bear's proposed environmental measures contained in its December 30, 2015 FERC license application and September 28, 2018 Species Protection Plan [SPP]).

This is all the more true when we consider that the new proposed measures are based on MDMR's recently developed, apparently private, unpublished changes to fish management goals that reflect a sharp break from MDMR's longtime collaborative fish management approach for the Union River. The numeric performance standards (discussed further in Comment 2), infrastructure mandates, and adaptive management obligations in MDMR's August 8, 2025 letter commenting on Black Bear's WQC application are not only unprecedented, but they are also biologically unsupported and lack sufficient technical justification and feasibility analysis. In addition, they go far beyond any state goals described in current fishery management plans and attempt to do what MDMR can only do through a public process in conjunction with other agencies.

As discussed further below in response to Comment 4, given the success story of river herring restoration in the Union River, and because an Atlantic salmon stock rebuilding plan has not yet

[2] Section 5.2.3 of FERC's Final Environmental Analysis explains staff's rationale for not recommending out-of-scope 10(j) recommendations and Appendix A responds to MDMR's comments on the DEA.

started, it makes sense to proceed with providing new upstream fish passage facilities 15 years after license issuance, per the Commerce fishway prescription, instead of in five years, as MDMR proposes.

2. Use of anadrofish model for developing species-specific passage performance standards

MDMR comment

MDMR utilized the anadrofish life-history model to develop species-specific passage performance standards as they relate to 1) prospective fish passage efficiency at the Ellsworth and Graham Lake Dams, and 2) minimum annual returns of American shad, alewife, and blueback herring per acre of habitat (Table 1).

Table 1. Alosine restoration targets and passage performance standards recommended by MDMR in their August 8, 2025 letter.

Species	Min. goal to pass Ellsworth Dam	Min. goal to pass Graham Lake Dam	Upstream passage performance standard at each dam (%, 48 hrs)	Downstream passage performance standard at each dam (%, 24 hrs)
American shad	60,598	54,530	77	95
Alewife	6,893,490	6,174,860	92	95
Blueback herring	357,676	321,860	85	95

Black Bear response

In addition to MDMR's August 8, 2025 comment letter, Black Bear reviewed a number of related sources to assess the application of MDMR's use of anadrofish, including model design, assumptions, and implementation (Atlantic States Marine Fisheries Commission [ASMFC] 2020, Stich et al. 2025, Zydlewski et al. 2021). As a result, Black Bear has identified the following concerns regarding MDMR's use of anadrofish to establish species-specific passage performance standards:

- No peer-reviewed manuscript exists outlining model input parameters and demographic rates (e.g., egg to outmigrant survival, fecundity) as specifically applied to modeled population dynamics for the species evaluated in the Union River and waters above Ellsworth and Graham Lake Dams. As noted in MDMR's August 8, 2025 letter "A peer-reviewed manuscript detailing the utility of this model for Maine Rivers is in prep and is supported by MDMR, NOAA, and SUNY Oneonta." However, an end user/reviewer cannot effectively evaluate the accuracy of the model's estimated performance standards without understanding the values and variability of the input data as specific to this system.

- No formal, quantitative, sensitivity analysis exists for this stochastic demographic model per any of the literature sources reviewed for which anadrofish was applied. Quantitative sensitivity analyses are common and expected features of similar lifecycle models (see Morris and Doak 2002; Cordoleani 2020). This suite of models typically contains several input parameters of variable certainty and is often derived from surrogate population data. Without conducting sensitivity analyses, it is difficult to ascertain which input parameters bear the most weight on subsequently estimated static point performance standards, which is necessary for accurately characterizing potential uncertainty in the model-estimated performance standards.
- This model is stochastic, and thus, there is variability in the modeled outputs. As such, the proposed static performance standards should include prediction/confidence intervals around them, which reflects this variability and uncertainty. This has implications with respect to determining thresholds of compliance. For example, MDMR states on p. 20 of their August 8, 2025 letter, "If upstream performance standards have not been achieved, and the results are not close (within 10% of performance standard criteria for passage effectiveness or timing for tested species), Brookfield shall (do the following)....." However, the provided static model target performance standard (*e.g.*, on p. 8 "Achieve an upstream passage performance standard of 77% within 48 hours for American shad...") may actually be estimated as plus or minus n% within a specific confidence or prediction interval.
- This model assumes all "potential habitat" is equally suitable (as applied in Zydlewski et al. 2021), when true "suitable habitat" assessment by life stage is the level of resolution required to propose exacting population targets. This assumption is likely to result in an overestimation of truly suitable habitat. Hydraulic habitat suitability (depth and velocity), temperature threshold criteria, and similar microhabitat and suitability criteria are called for to increase resolution and accuracy of potential life-stage-specific habitat needs estimation for individual systems.

Given these identified issues, Black Bear does not think it is warranted to use anadrofish to develop new species-specific passage performance standards for the Ellsworth Project dams. Rather, passage performance standards for Atlantic salmon should rely on the Commerce fishway prescription; for other identified species, passage performance standards should be developed by MDMR as part of a collaborative effort as has historically been done with the CFMP for the Union River, rather than imposed as conditions in an MDEP WQC.

3. Current upstream fish passage is ineffective

MDMR comment

MDMR claims that current upstream fish passage is ineffective, including the following comments:

> p. 2 – "No upstream passage for American eel, blueback herring, American shad, and sea-lamprey has occurred and only limited trucking of alewife and Atlantic salmon captured at the Ellsworth fish trap has occurred since the construction of the interim fish trapping facility in 1974."
>
> p. 2 – "the lack of effective upstream and downstream passage measures will prevent meaningful restoration of any diadromous fish species above the projects and would prevent the achievement of MDMR's management goals for the Union River."
>
> p. 15 – "It is both reasonable and prudent to construct the flume and swim-through fishway at the Ellsworth Project to address these longstanding passage failures and achieve modern performance expectations."

Black Bear response

There is good reason to substantively reject MDMR's claim that current upstream fish passage is inadequate Current trap and transport for river herring, which, contrary to MDMR's claim, does in fact include blueback herring when they are present in the river, has been very successful and has long been a success story in the State.

Black Bear has transported river herring at the direction of MDMR to meet MDMR's stocking goals, and per instructions of MDMR, with the remainder harvested for lobster bait. Black Bear consults with MDMR regarding the stocking plans during an annual fish passage planning meeting and keeps MDMR apprised of the stocking process throughout the river herring run in the spring.

MDMR, and not the fish passage facility itself, is the primary limiting factor on the number of fish moved upstream of the Ellsworth dam. MDMR can always choose to have Black Bear pass more fish and to reduce the river herring harvest by the City of Ellsworth, which would result in increasing the run size of alewife and blueback herring.

MDMR's restriction of the growth of the river herring run in the Union is substantiated by the following:

- Commerce fishway prescription (p. 482 of FERC's July 29, 2019 FEA): "The State of Maine currently limits the number of alewife and blueback herring stocked into the watershed, and trap counts demonstrate that the facility is effective for meeting stocking goals."

- FEA, pp. 75 – "In addition to collecting river herring to transport upstream, the City of Ellsworth harvests river herring from the trap and truck facility which are sold as lobster bait to commercial fishers under a cooperative management agreement with Maine DMR (URFCC, 2015)".
- FEA, p. 146 – "Maine DMR's escapement goal of 35 fish per acre has been exceeded since 2015 (see Figure 19). As Figure 13 shows, the existing fishway trap and truck facilities have been effective at passing the number of river herring targeted by Maine DMR for escapement for the 2015 through 2017 migration seasons. Although run size has been adequate to support current escapement goals in most years since 1996, Figure 13, which also shows harvest in addition to run size and escapement, suggest that prior to 2015, management decisions favoring harvest over escapement were the reason that escapement targets were not being met."
- FEA, p. 147 – "Because the current facilities are operating at substantially less than their design capacity, they should also be able to accommodate increased passage in the event that Maine DMR increases the targeted number or river herring escapement."

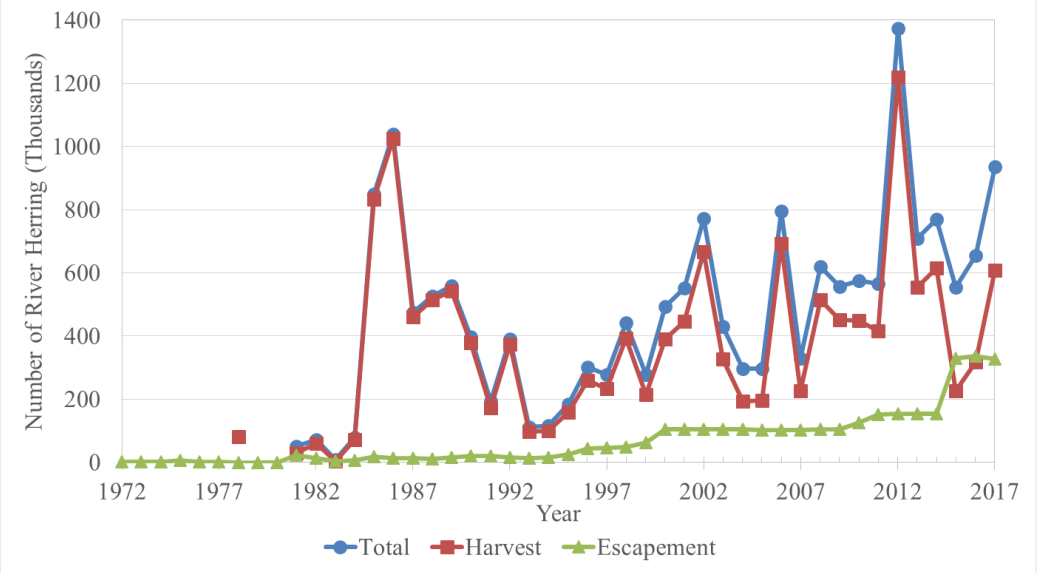

Figure 13. The number of river herring harvested and transported upstream (escapement) from the Ellsworth Project trap and truck facility. (Source: URFCC, 2000-2018 as modified by staff). (FEA, p. 76)

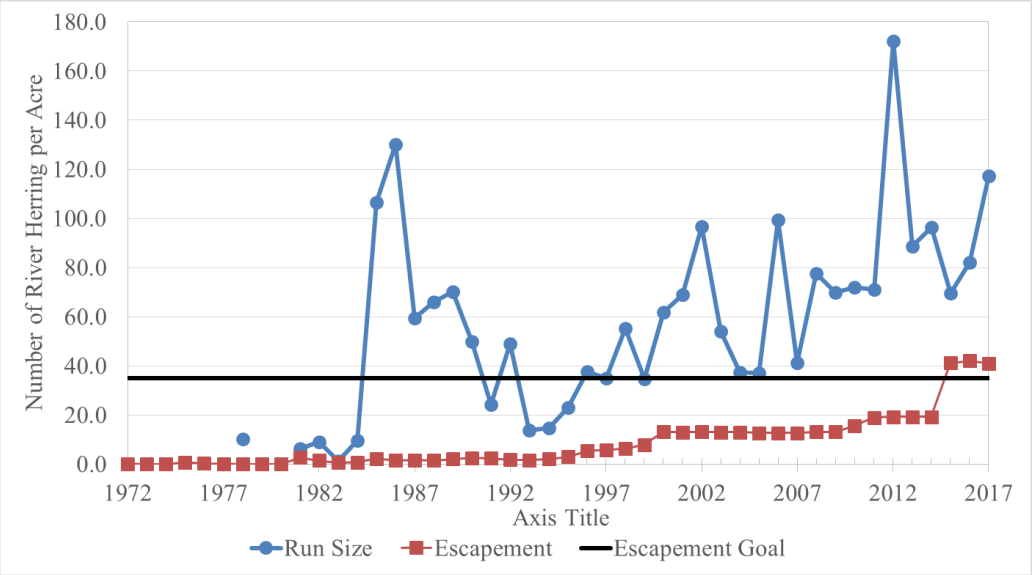

Figure 19. The run size and escapement in fish per acre at the Ellsworth Project. The target run size is 235 fish per acre, and the solid black line shows the escapement goal of 35 fish per acre. (Source: URFCC, 2010-2018, as modified by staff). (FEA, p. 147)

FERC further notes (FEA, p. 188), that "the exploitation rate for alewives in the Union River ranged from 65 to 89 percent from 2000 to 2017 (URFCC, 2000 to 2018)." By decreasing the harvest (red line in Figure 13 above), and passing more river herring upstream to spawn, the number of returning fish would be expected to increase substantially in future years.

The effectiveness of the current upstream passage system for passing river herring further strengthens the Commerce requirement for providing new upstream fish passage facilities in 15 years following license issuance as discussed in the response to Comment 4 below.

4. Timing for providing new upstream fish passage facilities (15 years vs 5 years)

MDMR comment

MDMR states the new upstream fish passage facilities are needed in five years, not 15 years, as required by Commerce in its fishway prescription:

> pp. 2-3 – "For upstream passage, the applicant's proposal does not include provision of a timely volitional upstream fish passage plan for all species. This approach cannot achieve adequate passage success for meaningful restoration."
>
> p. 4 – "MDMR does not consider it appropriate or scientifically defensible to delay construction of volitional upstream fish passage at the Ellsworth Project until year 15 of the new license as proposed, with fishways just focused on Atlantic salmon as the target species."

p. 15 – “While the existing requirements include the development of a state of the art swim-through fishway no later than year 15 of any new license, this timeline has no biological basis and the continuous impacts are too significant for this amount of delay, particularly given the delays since expected relicensing. The focus on Atlantic salmon as the only target species and timeframe is not supportive of all indigenous species and DMR’s goals for the watershed. Current passage conditions are neither safe nor timely, and they fail to support long-term goals. Given the significant delay in implementing volitional fish passage and the immediate risks to ESA-listed species, requiring final design approval within two years and full facility implementation within five upstream passage seasons is both reasonable and essential.”

Black Bear response

Other than MDMR conducting additional analyses, fundamentally, nothing has changed since Black Bear submitted the license application for the Ellsworth Project in December 2015 and the Species Protection Plan (SPP) in September 2018. FERC issued the FEA in 2019, which included the fishway prescriptions from both Commerce and Interior, and NMFS issued a Biological Opinion in 2020. It is imperative that MDEP not dismiss the comprehensive and still-relevant analyses conducted by FERC, NMFS, and USFWS during the relicensing process.

Specifically, Commerce’s requirement for providing new upstream fish passage 15 years after license issuance, not five years, is justified for the reasons discussed below.

Atlantic salmon – MDMR references plans for the development of an Atlantic salmon stock rebuilding and management plan. Currently, only a small number of Atlantic salmon fry are stocked in the Union River, primarily for educational programs, and returning adult Atlantic salmon are largely strays, as noted by FERC in the FEA (p. 226), "Given the number of fry stocked upstream of the project in the Union River, and an estimated 3 percent straying rate of salmon from other rivers (such as the nearby Narraguagus and Penobscot Rivers), Commerce estimates that the salmon run should consist of approximately 5 returns and 36 strays."

To that end, between 2000 and 2024, 44 adult Atlantic salmon were captured at the lift; 19 were identified as restoration fish, while 25 were aquaculture escapees (MDMR unpublished data). In accordance with agency guidelines, Atlantic salmon captured in the Ellsworth fish lift that are identified as escaped—or potentially escaped—from aquaculture net pen facilities are not transported upstream to the headwater spawning areas of the Union River. The most recent restoration salmon captured prior to 2024 were in 2020 (n=3), and based upon genetic analysis, all were identified as strays from other rivers. In addition, the salmon which was captured in 2024 had indications of aquaculture origin (deformed fins), so it was released downstream of the dam per MDMR guidance.

Despite the lack of a restoration program and limited expected annual returns of Atlantic salmon per year to the Union River, Black Bear worked closely with NMFS during the relicensing process and the development of the SPP. The SPP contained fish passage measures that were

incorporated into FERC's 2019 FEA and were developed in close consultation with NMFS and USFWS through a series of meetings held between June 2017 and July 2018. Chief among these measures was the agreement to "design and install new upstream Atlantic salmon passage measures 15 years following FERC license issuance".

FERC summarized and expanded upon Commerce's justification of the 15-year window for providing upstream fish passage in the FEA:

- FEA (p. 229-30) – "The 15-year delay recommended by Commerce relates to several factors, including: (1) the time necessary to implement and test the effectiveness of prescribed downstream passage measures at Ellsworth and Graham Lake dams; (2) the time between experimental stocking of marked smolts and the resulting anticipated adult salmon returns (approximately 2 years, assuming smolts are available); (3) the time necessary to test the efficiency of the existing Ellsworth fishway at attracting and passing adult salmon (approximately 4 years);[209] and (4) the time necessary to evaluate the results of (1), (2), and (3) and incorporate learned information into the final design of the swim-through fishways.[210] Commerce states that with the known high rate of downstream smolt mortality at the project, it is prudent to improve downstream passage survival of smolts before focusing on improved passage of adult salmon upstream. Commerce estimates that 15 years should be sufficient time to confidently design and operate the new swim-through fishways.

  Ultimately, the best case scenario for Atlantic salmon is to have safe, timely, and effective downstream and upstream passage at the project as soon as possible. As discussed above, the existing upstream passage facility might actually provide safe, timely, and effective upstream passage. Conducting an effectiveness study of the existing upstream passage facility within the next 10 years to assess the efficacy of the modified downstream passage facilities and the existing upstream passage facility would allow for an assessment of the effectiveness of the existing upstream facility using adult salmon that are returning to the Union River. Following the effectiveness study, additional time would be required to determine whether any modifications to the existing fishway trap and truck facility are needed, or whether new upstream passage facilities are needed to provide safe, timely, and effective upstream passage at the project. If the upstream passage facilities are determined to be necessary, then the siting, design, and construction of the upstream facility could be undertaken. Considering this timeline, DSF's (Downeast Salmon Federation) recommendation to construct the swim-through fishways at both project dams operational within 2 years of license issuance could potentially result in the construction of facilities that would not significantly benefit the GOM DPS of Atlantic salmon."

River herring – The river herring run in the Union River was an early success story for restoration efforts in the State of Maine and continues to be one of the strongest runs in the State. A majority of river herring are allocated by MDMR for harvest for use as lobster bait; this does "threaten the survival" of a majority of the returning river herring to the Union River. Black Bear's trap and truck operations has promoted the restoration of the river herring run to the Union River. As noted in response to Comment 3, MDMR can direct Black Bear to pass more fish and to reduce the harvest by the City of Ellsworth (e.g., harvest of alewives in the Union River "...ranged from 65 to 89 percent from 2000 to 2017 [URFCC, 2000 to 2018]" (FERC 2019), which would result in increasing the run size of alewife and blueback herring to achieve MDMR's run target. Therefore, the current system can be continued to meet MDMR passage goals until the new upstream fishways are installed in Year 15 following license issuance per the Commerce fishway prescription.

American shad –The CFMP states the following (URFCC 2015):

- "A residual population of American shad together with strays from other river systems are likely present in the Union River estuary below the Ellsworth Dam. Shad have been observed incidentally in the commercial river herring harvest, by anglers, and historically by agency personnel attending the trap. Due to the lack of a viable source of broodstock, shad are not currently stocked in the Union River. When resources become available, shad restoration will focus on the historically accessible main stem and tributary habitat located above and below the Ellsworth Dam."

In the *American Shad Habitat Plan for Maine River Systems*, MDMR (2021) reports 4.9 miles (7.9 kilometers) of American shad habitat in the Union River, compared to the total of 1,008 miles (1,622 km) statewide. Thus, the Union River represents 0.5 percent of the State's total shad habitat, which is well below the amount of shad habitat in the Penobscot and Kennebec Rivers (representing 24.6% and 18.5% of the state's total shad habitat, respectively) (derived from MDMR 2021).

In its August 8, 2025 letter, MDMR refers to 665 acres of American shad habitat (73% of the shad habitat in the Union River basin) occurring above the Graham Lake Dam. Black Bear is uncertain how this relates to the 4.9 miles of shad habitat referenced in the 2021 *American Shad Habitat Plan for Maine River Systems* (MDMR 2021). The CFMP (URFCC 2015) does not refer to the acreage of shad habitat in the Union River, but rather notes that "DMR plans to focus its shad restoration effort on rivers other than the Union during the period 2015-2017, including the Kennebec, Androscoggin, Saco, Penobscot, and St. Croix."

Consistent with FERC's FEA and the Commerce fishway prescription, Black Bear plans to continue to operate the upstream fish passage facility at the Ellsworth Project (fishway and trap) for alosines and salmon until new or modified fishways or measures are required in the future. Black Bear will also continue to coordinate with the MDMR on river herring stocking and escapement targets, as well as continue to coordinate and support river herring harvesting efforts

(e.g., providing access for harvest to the trap and truck facility by the City of Ellsworth, which harvests river herring under a cooperative management agreement with MDMR). Black Bear will also consider conducting future effectiveness testing of the existing upstream fish passage facility in consultation with the agencies for American shad if management goals for this species in the Union River change or alewife passage targets increase.

In conclusion, Black Bear does not believe it is warranted to install new upstream fish passage facilities at the Project within 5 years of license issuance as recommended by MDMR in its August 8, 2025 letter, but rather within 15 years as outlined in FERC's FEA and Commerce's fishway prescription for the following reasons, as discussed in greater detail above:

- The time required to
    1. implement and test the effectiveness of prescribed downstream passage measures at Ellsworth and Graham Lake dams (approximately 6 years),
    2. stock marked smolts and their return of adults (approximately 2 years, assuming smolts are available),
    3. study the returning adults to test the efficiency of the existing Ellsworth fishway at attracting and passing adult salmon (approximately 4 years),
    4. evaluate these results and incorporate into the fishway design.
- The lengthy consultation and alignment with NMFS on provisions, including timing, for providing new upstream anadromous fish passage, leading up to the ESA consultation process between FERC and NMFS;
- The success of the current trap and truck operation for river herring; and
- The lack of emphasis on American shad restoration in the Union River in currently available management plans and the scarcity of shad below the Ellsworth Project.

5. Black Bear's current fish passage proposal is inconsistent with federal agency requirements

MDMR comment

MDMR argues that Black Bear's current fish passage proposal is inconsistent with federal agency requirements:

> p. 3 – "The current trap-and-truck system is ... inconsistent with the U.S. Fish and Wildlife Service's 2019 Fish Passage Engineering Design Criteria."
>
> p. 4 – "Federal agencies, including NOAA and FERC, have acknowledged that the applicant's proposed measures are likely insufficient without timely adaptive improvements."

Black Bear response

As noted above (Comment response 4), Black Bear coordinated with NMFS to adopt the upstream passage measures/timing that Commerce recommended in the fishway prescription,

which was attached to the FEA. In addition, Black Bear is required to implement the Interior prescription for American eel upstream and downstream passage. Therefore, Black Bear will implement the measures required by Commerce and Interior in their respective Section 18 fishway prescriptions, which FERC will incorporate into the new license. Also, in designing new fish passage facilities, Black Bear will employ the most recent USFWS design criteria, and fish passage facilities will be developed in consultation with resource agencies.

6. Adaptive management plan

MDMR comment

MDMR provides considerable details for an adaptive management plan for Black Bear to implement (pp. 19-25), including the following excerpts shown as examples:

pp. 20-1

E. "If upstream performance standards have not been achieved, and the results are not close (within 10% of performance standard criteria for passage effectiveness or timing for tested species), Brookfield shall construct the following measure no later than 4 years after the distribution of the effectiveness testing report:
    a. Design, construct, operate, and maintain attraction flow channel(s) capable of conveying 20% of station capacity to provide additional attraction

F. If downstream performance standards have not been achieved and the results are not close (within 10% of performance standard criteria for passage effectiveness or timing for the tested species), Brookfield shall construct a comprehensive measure no later than 4 years after the distribution of the effectiveness testing report. Measures could include:
    a. Construction of a new downstream fish bypass facility with low level and surface entrances
    b. Construction of additional crest gates or other spillway gates

G. If Brookfield is still not close to achieving performance standards (within 10% of performance standard criteria for passage effectiveness of timing), Brookfield will design and implement a new or replacement fishway that could achieve performance standards. This second or replacement fishway shall meet or exceed USFWS design criteria (2019 or current version), and shall be of comparable size to the fishway built in Year 5 of the license or larger, and shall include components or be designed to allow opportunity for continued municipal harvest and interim fish passage. ..."

Black Bear response

MDMR's discussions related to the adaptive management plans are overly prescriptive, biologically unsupported, lack sufficient technical justification and feasibility analysis, and are

not appropriate for a WQC. Typically, the adaptive management process is addressed at a higher level. For example, in their Fishway Prescription for the Project, Commerce noted (FEA p. 488):

- "If the defined performance standards (section 7.3.5) cannot be met with the above improvements, additional measures will be implemented to further reduce fish injury and mortality. Such measures may include increasing the depth of the guidance system, turbine curtailment or shutdowns, or modification of the spillway and/or the ledge at the base of the dam."

The measures that MDMR recommend are very costly (e.g., provide 20% of station capacity to provide additional attraction to upstream fishway; construct new downstream fish bypass facility with low-level and surface entrances; construct additional crest gates or other spillway gates; and add new or replacement upstream fishways) and wholly unsupported by either data or administrative record.

This level of detail should not be incorporated into a WQC. Rather, it is expected that Black Bear would work with MDMR and the federal agencies in an adaptive manner to meet fish passage requirements; flexibility in how the adaptive process proceeds in the future is important to allow for responding to new developments in technology or fish passage approaches, and to account for input from the agencies, as opposed to following detailed prescriptions for subsequent steps that were developed years before.

Black Bear has been and continues to be committed to implementation of safe, timely, and effective fish passage at the Ellsworth Project, and has coordinated with resource agencies through the FERC relicensing process to develop a sound approach and timeline for improving fish passage at the Project, as presented in FERC's FEA and Commerce's fishway prescription. Fish passage measures need to be reasonable and in accordance with a comprehensive fisheries management plan.

Under the provisions of the Federal Power Act, numerous pathways are available during FERC relicensing by which fish passage may be proposed or required for a hydro project, including a proposal by the applicant, 10(j) recommendation by a state or federal agency, requirement by FERC, or prescription by Commerce or Interior (under Section 18 of the Federal Power Act, 16 U.S.C. § 811).

MDMR's efforts to use the WQC process to negate the FERC relicensing process and decision documents is not justifiable because as noted in response to Comment 1, it would turn the licensing process on its head to now impose new and different fish passage measures, measures that resource agencies had not requested at any point until now, rather than those established during the FERC relicensing process (e.g., FERC's July 29, 2019 FEA, the Commerce and Interior fishway prescriptions, and Black Bear's proposed environmental measures contained in its December 30, 2015 FERC license application and September 28, 2018 SPP).

7. Potential for two fishways at each project

MDMR comment

As noted in Comment 6, MDMR indicated the potential need for two upstream fishways at each dam:

> pp. 8, 9, 10, 11 – "...potential for two fishways at each project...."
>
> p. 22 – "The benefits of multiple fishways are further supported by research from the Columbia River Basin. Keefer et al. (2021) found that average passage efficiency for Pacific salmonids at eight large-river dams exceeded 96 percent and attributed this exceptional performance to a sustained commitment to adaptive management, including redundancy in fishway options and continuous refinement of passage systems[82]. Notably, many of the dams in that study operate more than one fishway, offering fish multiple opportunities to pass and reducing the likelihood of delays or failures."

Black Bear response

The scale of the Columbia River and its salmon runs dwarf that of the Union River. For example, the Union River is approximately 130 feet wide below the Graham Lake Dam and 230 feet wide below the Ellsworth Dam. The Columbia River is much wider, measuring over 3,000 feet wide at the Bonneville Dam, Dalles Dam, and John Day Dam. The drainage area of the Union River at Ellsworth Dam is 547 square miles (ranking as only the 19th largest river in Maine [Baum 1982]), while the Columbia River drainage area is 259,000 square miles (approximately the size of France; Northwest Power and Conservation Council 2025), over 470 times larger.

In addition, the Pacific salmon run of the Columbia River is world famous, consisting of multiple species and stocks; the 2024 returns of adult salmon was nearly 2.5 million (ODFW 2025). There is an extensive salmon stocking program in the Columbia River with about 200 salmon hatchery programs in the Columbia River basin, which account for approximately 80 percent of returning salmon and steelhead (NOAA 2024).

As noted above in response to Comment 4, an Atlantic salmon restoration program has not been developed for the Union River (only Atlantic salmon fry are currently stocked), returning Atlantic salmon are primarily strays, and "Commerce estimates that the salmon run should consist of approximately 5 returns and 36 strays (FERC 2015)."

In the Columbia River basin, the large size of the river, the robust Pacific salmon run, and the considerable hydropower resources[3] collectively may warrant more than one upstream fishway at each dam. Given the relatively small size of the Union River, the significant cost of constructing and operating a second upstream fishway at each dam, and the lack of an Atlantic salmon

[3] By way of comparison, the capacity of the 31 hydropower projects in the Federal Columbia River Power System is more than 22,000 MW (Oregon Dept. of Energy 2025), while the capacity of the Ellsworth Project is 8.9 MW.

restoration program and salmon returns to the river, it is not reasonable to require Black Bear to build multiple fishways at Graham Lake and Ellsworth Dams.

8. Plunge pool evaluation

MDMR comment

MDMR recommended that Black Bear conduct a plunge pool evaluation:

> p. 27 – "Within 3 years of license issuance for the Ellsworth and Graham Lake projects, Brookfield shall verify that existing plunge pools meet or exceed USFWS design criteria. If any plunge pool does not meet USFWS design criteria, Brookfield will design appropriately sized plunge pools downstream of bypasses and other outfalls (e.g., spillways) that may provide downstream passage for fish in consultation with MDMR and as approved by DEP. Plunge pools should be designed such that plunge pool depths are 25% of the fall height or 3 feet, whichever is greater, with conveyance flows less than or equal to 25 fps, and should meet or exceed other USFWS design criteria."

Black Bear response

Black Bear conducted a plunge pool evaluation and provided the analysis to FERC during the Project relicensing in an October 10, 2018 additional information response[4], as copied below:

> "5. Provide the depth of the plunge pool at Graham Lake, and at Ellsworth at both high and low tide.
>
> Graham Dam: The floor of the bay containing the downstream fish passage weir is at elevation 71.0' and the normal tailwater is at elevation 80.5', therefore the plunge pool is generally around 9.5 ft deep.
>
> Ellsworth Dam: Normal low tide is 4.5' and normal high tide is 9.0'. The bottom of the tailrace at the immediately adjacent Unit 1 is no higher than approximately -3.5'.
>
> Although Black Bear does not have confirmatory drawings at the bottom of the plunge pool location, the minimum depth of the plunge pool appears to be several feet with a potential depth of approximately 12 feet. There is no exposed ledge in this location even at the lowest tide."

[4] FERC elibary accession number - 20181010-5110

9. Periodic fish kills

MDMR comment

MDMR noted periodic fish kills occur at the Project and delayed access to habitat threaten the survival of multiple species:

> p.2 – "continued downstream fish kills need to be addressed at these projects."
>
> p.3 – "Numerous incidents of mass fish mortality have occurred at this project, including eight fish kill events between 2014 and 2018[6] and filings and media reports documenting fish mortality at the project in many years [7,8]. Thus, it is paramount to keep fish out of the project turbines."
>
> pp. 3-4 – "Ongoing fish mortality events and delayed access to habitat threaten the survival of multiple species, including endangered Atlantic salmon."
>
> p. 19 – "MDMR has analyzed age structure and repeat spawner data for the Union River going back to 2008 that indicates that the alewife population in the Union is dominated by age-3 and age-4 fish with very few repeat spawners, suggesting that adults do not survive downstream migration."

Black Bear response

FERC noted in the FEA (P. 446) that "... there is strong evidence that juvenile alosines move downstream after significant rain events. Therefore, the staff-recommended shutdowns following rain events and observations of schools of outmigrating alosines in the forebay have a sound basis and are expected to significantly reduce entrainment-related fish kills. Until permanent modifications are made to improve the safety of downstream passage for juvenile alosines, staff's recommended interim measures would help reduce mortality caused by entrainment-related fish kills."

Periodic fish mortality events and delayed access to habitat do not threaten the survival of multiple species.

- River herring – As noted above, the river herring run in the Union River was an early success story in the State and continues to be one of the strongest runs in the State. A majority of river herring are allocated by MDMR for harvest for use as lobster bait; this does "threaten the survival" of a majority of the returning river herring to the Union River. Black Bear's trap and truck operations has promoted the restoration of the river herring run to the Union River. See response to Comment 3.
- American shad – Shad are rarely collected at the fish trap at Ellsworth Dam (MDMR 2025a, 2025b).

- Atlantic salmon – Atlantic salmon in the Union River occur primarily as strays; as noted above, “Commerce estimates that the salmon run should consist of approximately 5 returns and 36 strays (FERC 2019)." Black Bear will be implementing a number of measures to enhance downstream passage for Atlantic salmon, as outlined in the SPP, FEA, and Commerce fishway prescription.

MDMR’s reference that the alewife population in the Union River is dominated by age-3 and age-4 fish with very few repeat spawners, suggesting that adults do not survive downstream migration is the logic MDMR presented during relicensing, to which FERC responded in the FEA (p. 188):

- “While the lack of older, repeat alewife spawners could be associated with high downstream passage…, high exploitation rates (the percentage of population that is harvested) also reduce the number of older, repeat spawners in the population (ASMFC, 2012). As discussed above, the City of Ellsworth harvests river herring from the trap and truck facility for sale as lobster bait to commercial fishers under a cooperative management agreement with Maine DMR. The exploitation rate for alewives in the Union River ranged from 65 to 89 percent from 2000 to 2017 (URFCC, 2000 to 2018). These exploitation rates overlap with the exploitation rates calculated by ASMFC (2012) that could cause population collapse (i.e., 62 to 80 percent, depending on the assumptions used regarding the population growth rate). Therefore, the high exploitation rates combined with potentially low downstream passage survival of adult alewives appear to be contributing to a low number of older, repeat spawners in the Union River at this time.”

While the above response is provided to address the referenced MDMR comments, Black Bear notes that, as a result of the relicensing process, including Commerce and Interior fishway prescriptions, Black Bear will be implementing enhancements to the downstream passage system at the Ellsworth Project to reduce fish kills. During the relicensing process, MDMR stated in its January 16, 2019 section 10(j) letter to FERC providing comments on the draft EA “The MDMR concurs with the downstream fish passage measures that were proposed by Black Bear Hydro and recommended by Commission Staff (Section 5.2.1, pages 324-325) and the additional measures recommended by Commission Staff (Section 5.2.2, Pages 327-328).”

10. Downstream passage – turbine shutdown

MDMR comment

MDMR recommended the following for turbine shutdowns at Ellsworth Station to facilitate downstream migration of eels and alosines:

> p. 16 - In the interim four years before this requirement[5], Brookfield shall perform targeted shutdowns for American eel and alosines at the Ellsworth Project. For eels, Brookfield shall shut down the project at night (½ hour before dusk to ½ hour before dawn) from August 15 to November 15. In addition, Brookfield shall shut down the project immediately following a storm event that results in 15% of the average monthly rainfall during the downstream alosine passage season (June 1 to November 30). The project shall be shut down for 5 consecutive days following the storm.

Black Bear response

FERC echoes Interior's prescription in the FEA for turbine shutdowns to provide safe, timely and effective passage for American eel, as well as anadromous fish species passage. Table 2 below compares the Interior prescription to MDMR's corresponding recommendation, as outlined in its August 8, 2025 letter.

Table 2. Comparison of the Interior and MDMR recommendations for shutdowns following storm events to facilitate downstream eel passage.

Component	USFWS Prescription	MDMR Recommendation
Shutdowns for eel passage		
Season	September 1 – October 31	August 15 – November 15
Duration	8 PM to 4 AM	½ hour before dusk to ½ hour before dawn
Shutdowns following storm events		
Seasonal	August	June 1 – November 30
Duration	3 nights (8 PM to 4 AM)	5 days (duration not specified)
Rainfall trigger	>1-inch of rainfall in a 24-hour time period	15% of the average monthly rainfall

As noted in Comment 9, during the relicensing process, MDMR stated in its January 16, 2019 section 10(j) letter to FERC providing comments on the draft EA "The MDMR concurs with the downstream fish passage measures that were proposed by Black Bear Hydro and recommended by Commission Staff (Section 5.2.1, pages 324-325) and the additional measures recommended by Commission Staff (Section 5.2.2, Pages 327-328)." MDMR has not provided an explanation

[5] Prior to Black Bear installing, per MDMR's recommendation "... 0.75-inch or less, full depth, angled or inclined rack structure upstream of the forebay, new surface bypass systems at the Ellsworth Dam and low level (multiple entrances) bypass systems at the Ellsworth and Graham Lake dams within five years of license".

for why it is now recommending that additional protection measures via the referenced shutdowns are needed. Black Bear recommends that MDEP adopt the USFWS prescription requirements related to shutdowns.

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